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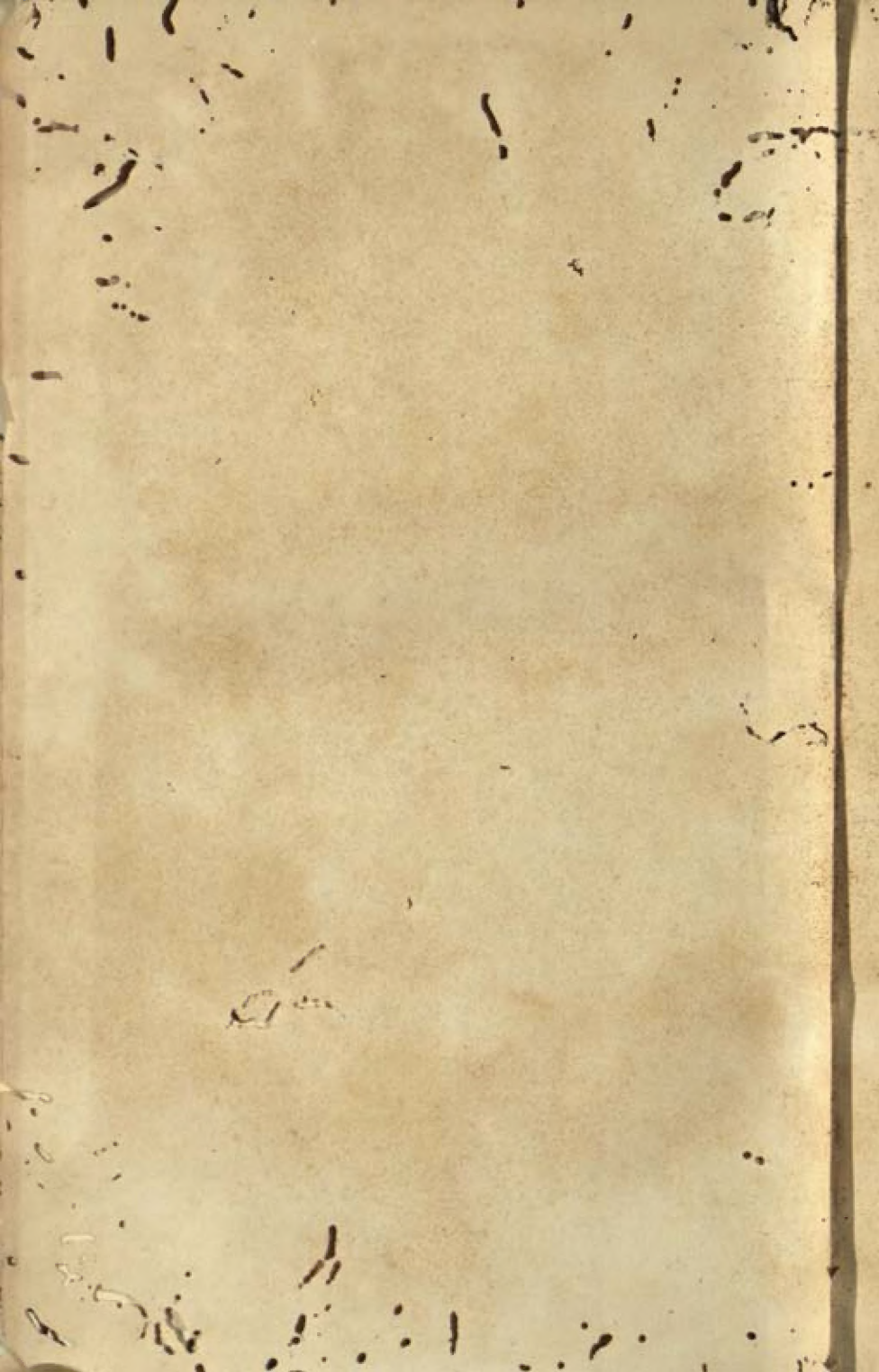
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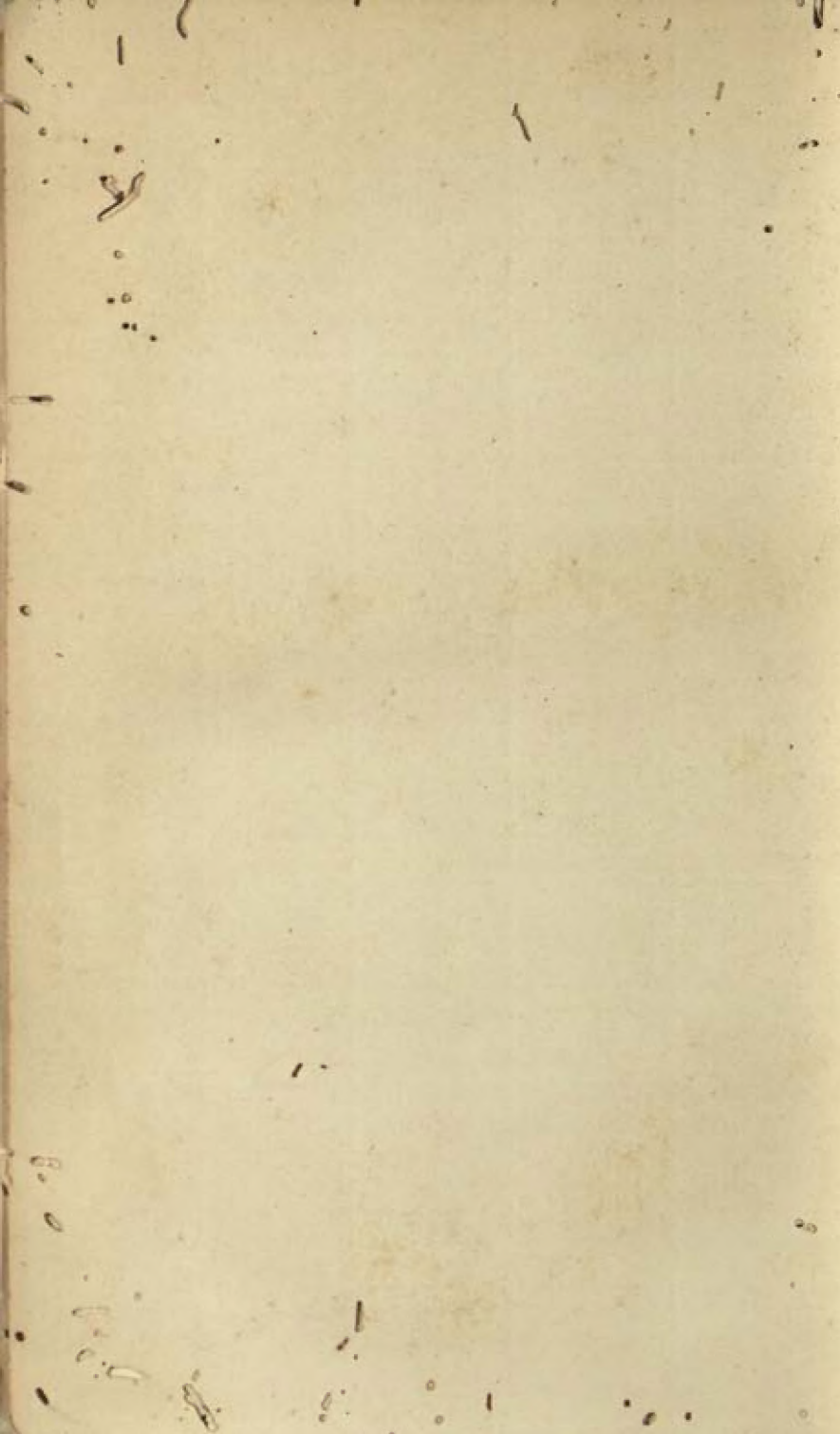
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THE
JOURNAL

OF THE
ROYAL GEOGRAPHICAL SOCIETY

OF
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LONDON.

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1844.



JOHN MURRAY, ALBEMARLE STREET.

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Royal Geographical Society.

1844.

REPORT OF THE COUNCIL.

READ AT THE ANNIVERSARY MEETING, 27TH MAY.

THE Council have much pleasure in reporting that the accession of new members since the last Anniversary has been double that of the former year;—38 ordinary and one corresponding member, Count Ranuzzi, of Bologna, having been elected. There have occurred in the same period 23 vacancies, of which 10 by death and 7 resignations. Six members have been struck off for non-payment. The Society now consists of 671 members, exclusive of 61 Foreign Honorary and Corresponding Members.

It is also with no ordinary gratification the Council announce that His Royal Highness Prince Albert has graciously condescended to accept the office of Vice-Patron of the Society.

Finances.—By a reference to the accompanying Balance-sheet, made up to the 31st of December, 1843, the members will observe that the expenditure continues to be kept down to what is strictly indispensable. The circumstance which rendered necessary the sale of 580*l.* stock in the early part of the financial year was explained in the last Report of Council, and the Council have great pleasure in stating that no fresh necessity has since occurred for trenching on the Society's funds. Nor are there at the present moment any sums due by the Society beyond current expenses.

Arrears.—The arrears of annual subscription, though diminished, still unfortunately continue to be considerable. They amounted on the 1st of January to 556*l.*, of which, since that date, 133*l.* have been collected. Of the amount still remaining due, 305*l.* are considered recoverable.

Money Grants.—No money grants have been made since the

last Anniversary, but the sum of 50*l.* has been paid to Mr. Howse, of Cirencester, it being the remainder of a grant made to that gentleman by a Resolution of Council bearing date the 7th June, 1834, in order to enable him to publish a grammar of the Cree language, for which assistance a proportionate number of copies of the work are to be the property of the Society.

Royal Donation.—Of the two gold medals forming the donation of Her Most Gracious Majesty, that called the Founder's Medal has been awarded to Mr. William J. Hamilton for his valuable researches in Asia Minor, and the important work in which he has consigned their results; and that called the Patron's Medal to M. Adolph Ermann for his important geographical labours in Siberia and Kamstchatka, his numerous astronomical determinations of positions, and his magnetic observations, as also for his valuable work "*Reise um die Erde.*"

Private Donations.—It will be seen by the Balance-sheet that the Society is indebted to the liberality of the Rev. Thomas Halford for a donation of 50*l.*; and the Council have much pleasure in announcing that Mr. James Alexander, who presented a like sum in 1842, has, in the present year, sent a second donation of the same amount.

Journal.—The Council have to regret the circumstances which have prevented the latter numbers of the Journal from appearing in due season. Experience having convinced them that such delay in its appearance is ever likely to result from its not being edited by the Secretary, the Council have finally settled that the duties of Secretary and Editor shall be vested in the same person; and they make no doubt, from the known zeal, industry, and regularity of your present Secretary, that the arrears of the Journal will be got up in the present year, and that henceforth it will appear with the same regularity that characterised its publication before the duties were separated.

Index.—With regard to the Index, the Council, in consideration of its great utility, have ordered it to be printed forthwith, though the number of names inscribed for it is very far from securing a sum sufficient to defray the expense. It is now going

through the press, and will be ready for delivery before the end of the Session, when it is confidently anticipated that every one who has the Journal will take a copy, in order that the finances of the Society be not burthened with the expense of printing a work, the preparation of which has been a gratuitous labour on the part of your Secretary.

Library.—The accessions to the Library since the last Anniversary Meeting consist of 256 volumes, 3 atlases, and 218 maps and charts, 99 of which latter have been, with their usual liberality, presented by the Lords Commissioners of the Admiralty. The Society is also indebted to Mr. Malby for two very handsome modern 18-inch globes, and to Lady Tremaine Rodd for a medallion of her father, the celebrated Major Rennell.

The same want of means alluded to in the last Report of Council unhappily precludes that arrangement of our books and maps so essential to their perfect preservation. Notwithstanding which, the Council, in concluding this Report, are happy to state that the Society is in an improving condition, and that little more is wanting to ensure an increase of its energies than a constant accession of new members to overbalance vacancies, and a punctual payment of annual subscriptions.

BALANCE-SHEET FOR 1843.

viii

Royal Geographical Society.

		Dr.		Cr.	
		£.	s. d.	£.	s. d.
Balance in the Banker's hands on the 1st of January, 1843		30	11 2		
Entrance of 20 Members, at 3 <i>l</i> .		60	0 0		329 11 3
Composition of 9 Members, at 17 <i>s</i> .		153	0 0		400 0 0
Subscription of 255 Members, at 2 <i>l</i> ., and overpaid 1 <i>l</i> . 9 <i>s</i> .		511	9 0		21 0 0
Arrears paid up		90	0 0		26 0 0
Dividend for six months on 3150 <i>l</i> . Stock, 3 <i>½</i> per Centa. Received, 53 <i>l</i> . 10 <i>s</i> . 5 <i>d</i> .; idem on 3578 <i>l</i> . 4 <i>s</i> . 4 <i>d</i> ., 43 <i>l</i> . 16 <i>s</i> . 1 <i>d</i> .;					45 6 1
Income Tax deducted; making together		97	6 6		30 14 24
Royal Premium		52	10 0		39 16 8
Journals sold		78	8 6		14 8 8
Rev. Thomas Halford's Donation		50	0 0		5 3 0
Stock sold out		581	1 6		12 0 0
					29 10 6
House Rent and Fixtures					
Salaries of Secretary, Editor, and Librarian					
Collector's Salary					
Messenger's Wages					
Firing and Lights					
Stationary					
Freight, Duty, Carriage of Parcels, Postages, &c.					
Evening Meetings					
Insurance, Advertisements, and Power of Attorney					
Instruments					
Furniture, Repairs, and Fittings, and Hire of Chairs for Evening Meetings					
Journal Printing, Part II. Vol. 11, and Part I. Vol. 12				£268 0 0	
" " Part II. Vol. 12				91 12 6	
" Illustrations for Part II. Vol. 11, and Part I. Vol. 12.				154 12 0	
Miscellaneous Printing					
Day's Bill for Illustrations, 1836 to 1840					1 17 6
Books, Maps, and Bindings					9 10 0
Royal Premium					16 13 10
Grant to Dr. Beke					47 0 0
Subscriptions returned					100 0 0
Sundries					4 0 0
Balance in the Banker's hands Jan. 1, 1844				£51 5 11	
" of Petty Cash				1 19 0 <i>½</i>	
					53 4 11 <i>½</i>
					£1,704 6 8

The above Accounts have been compared with the corresponding vouchers, and found to be correct.

GEORGE DODD, } *Auditors.*
THOS. LEE, }
JOHN BIDDULPH, *Treasurer.*

January 24, 1844.

ESTIMATE FOR 1844.

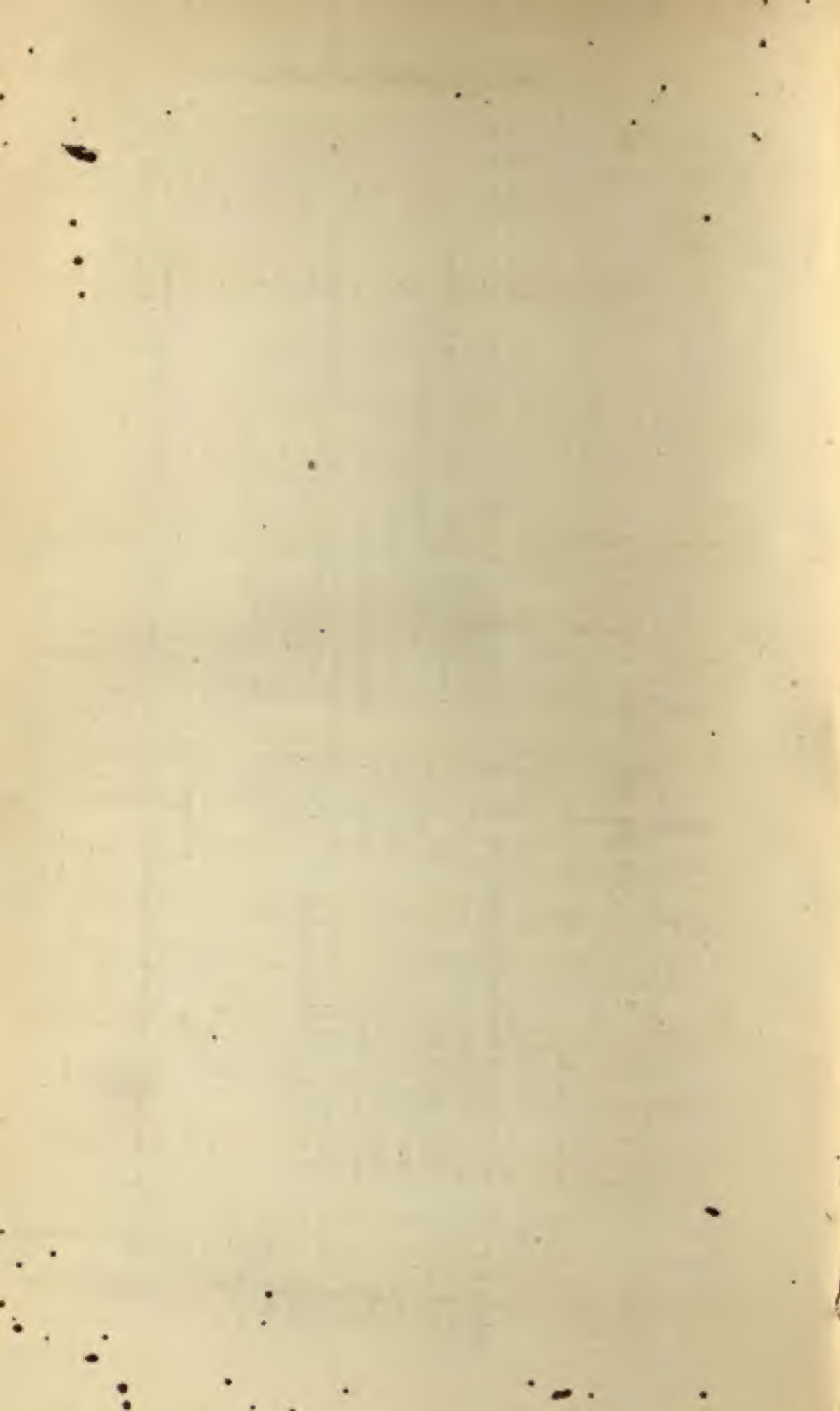
Dr.

Q

Royal Geographical Society.

	£.	s.	d.	£.	s.	d.
Balance in the Banker's hands on the 1st of January, 1844	51	5	11			
Balance of Petty Cash, in the Secretary's hands	1	19	0½			
Probable Amount of Subscriptions, viz.:						
Entrance of 30 Members at 3 <i>l</i> .			90	0	0	
Composition of 15 Members at 17 <i>l</i> .			255	0	0	
Subscriptions of 300 Members at 2 <i>l</i> .			600	0	0	
Arrears likely to be recovered			100	0	0	
Dividend on 257 <i>l</i> . 4 <i>s</i> . 4 <i>d</i> . Stock (3½ per Centa. Reduced)	67	12	2			
Royal Premium			52	10	0	
Journals sold			120	0	0	
	£1,358	7	14			
Balance in the Banker's hands on the 1st of January, 1844				263	13	0
Balance of Petty Cash, in the Secretary's hands				447	0	0
Probable Amount of Subscriptions, viz.:						
Entrance of 30 Members at 3 <i>l</i> .			90	0	0	
Composition of 15 Members at 17 <i>l</i> .			255	0	0	
Subscriptions of 300 Members at 2 <i>l</i> .			600	0	0	
Arrears likely to be recovered			100	0	0	
Dividend on 257 <i>l</i> . 4 <i>s</i> . 4 <i>d</i> . Stock (3½ per Centa. Reduced)						
Royal Premium						
Journals sold						
				100	0	0
				£1,331	16	0

J. R. JACKSON,
Secretary.



ACCESSIONS TO THE LIBRARY.

TO 27TH MAY, 1844.

EUROPE.

*Titles of Books.**Donors.*

- BELGIUM.**—Statistique de la Belgique, Mines, Usines Minières, Machines à vapeur. Rapport au Roi. 4to. Bruxelles, 1842. } M. VANDERMAELEN.
- Coup d'Œil sur la Géologie de la Belgique. Par J. J. D'Omalius D'Halloy. 8vo. Bruxelles, 1842. } M. J. J. D'HALLÖY.
- BRITISH ISLES.**—Sailing Directions for the Coast of Wales. 8vo. 1844. } HYDROGRAPHIC OFFICE, ADMIRALTY.
- Sailing Directions for the River Shannon. 8vo. 1844. } Idem.
- England und Wales in Geognostischen und Hydrographischen Beziehung von H. Meidinger. 8vo. Frankfurt, 1844. } M. H. MEIDINGER.
- FRANCE.**—Murray's Handbook for Travellers in France. 8vo. London, 1843. } JOHN MURRAY, Esq.
- Géographie prototype de la France, &c. Par Denaix. 8vo. 1844. } M. LE COL. DENAIX.
- GREECE.**—The History of the Manners and Customs of Ancient Greece. By J. A. St. John. 3 vols. 8vo. 1842. } J. A. ST. JOHN, Esq.
- ICELAND.**—De Mensura et Delineatione Islandiæ interioris, &c. Scripti Bjornus Gunnlaugi filius. 8vo. pamphlet. 1834. } W. C. TREVELLAN, Esq.
- NORMANDY.**—Recherches sur l'Origine, l'Étymologie, et la Signification primitive de quelques Noms de lieux en Normandie. Par M. de la Roquette. 8vo. } M. DE LA ROQUETTE.
- RUSSIA.**—Table des Positions Géographiques Principales de la Russie. Rédigée par M. W. Struve. 4to. St. Petersburg, 1843. } M. W. STRUVE.
- SWITZERLAND.**—Chamonix, le Mont Blanc, et les deux St. Bernard de Sext. Par M. J. L. Manget. 8vo. 1843. } M. PAUL CHAIX.

ASIA.

- ARABIA.**—The Historical Geography of Arabia. By the Rev. Chas. Forster. 2 vols. 8vo. 1844. } The Rev. C. FORSTER.
- ASIA.**—Die Erdkunde von Asien. Von Carl Ritter. Vol. 7, Part 1, 8vo. } PROFESSOR C. RITTER.

Titles of Books.	Donors.
Asia.—Die Hellenistischen Colonien des Ostens. Von J. G. Droysen. 8vo. 1843	M. J. G. DROYSEN.
— Journal of the Asiatic Society of Bengal, in Continuation	
— Journal Asiatique, in Continuation	ASIATIC SOCIETY, PARIS.
— Journal of the Royal Asiatic Society, No. 14. 8vo. 1843	ROYAL ASIATIC SOCIETY.
— Journal of the Society, Bombay Branch, Nos. 3 & 4	BOMBAY ASIATIC SOCIETY.
CHINA.—Note sur l'Île d'Hainan, sur les religieux de la Mission de la Chine, et sur les Chinois. Par M. de la Roquette. 8vo	M. DE LA ROQUETTE.
INDIA.—De Dehli à Bombay, fragment d'un Voyage dans les provinces intérieures de l'Inde en 1841. Par M. le Dr. G. Roberts. 8vo. Paris, 1843	
SINDH.—Personal Observations on Sindh. By Capt. T. Pons. 8vo. London, 1843	SIR CHAS. MALCOLM.

AFRICA.

ABYSSINIA.—Journals of the Rev. Messrs. Isenberg and Krapf, in Shoa, in 1839 to 1842. 8vo. London, 1842	CHURCH MISSIONARY SOCIETY.
— Premier Voyage à la recherche des Sources du Bahr-el-Ahmad ou Nil Blanc, Ordonné par Mohammed Aly, sous le Capitaine de Frégate Selim Bimbachi. 8vo. Paris, 1842	
AFRICA.—The Foulahs of Central Africa and the Slave Trade. By W. B. Hodgson. 8vo. 1843	W. B. HODGSON, Esq.
ALGERIA.—Tableau de la situation des Etablissements Français dans l'Algérie en 1841. 4to. Paris	GENERAL PELET.
EGYPT.—Mémoire sur le lac Moeris par Linant de Bellefoula. 4to. Alexandre, 1843	THE EGYPTIAN SOCIETY, CAIRO.
SOEL.—Enquiry into the Means of establishing a Ship Navigation between the Mediterranean and Red Sea. By Capt. Vetch, R.E. 8vo. London, 1843	CAPT. VETCH, R.E.

AMERICA.

AMERICA, Historical, Statistic, and Descriptive. By J. S. Buckingham, Esq. 3 vols. 8vo. London, N.D.	EDWARD DOUBLEDAY, Esq.
— NORTIL.—Journal d'un Voyage dans l'Amérique Septentrionale. Par De Charlevoix. 6 vols. 8vo. Paris, 1746	
— Vues et Souvenirs de l'Amérique du Nord. Par F. de Castelnau. Livraisons 4 to 7. 4to. 1842	M. DE CASTELNAU.
— Discoveries on the North Coast of America, &c. By Thomas Simpson. 8vo. London, 1843	
— Relations des Quatre Voyages entrepris par Christophe Colomb pour le découverte du Nouveau Monde, 1492 à 1504. Traduit de l'Espagnol par de Verneuil et de la Roquette. 3 vols. 8vo. Paris, 1828	M. DE LA ROQUETTE.

Titles of Books.

Donors.

- AMERICA, SOUTH.—Die Republiken von Süd Amerika Geographisch-Statistisch. Von Dr. J. E. Wappäus. 1 Part. 8vo. 1843 } Dr. WAPPÄUS.
- Archivo Americano (a Buenos Ayrean Periodical). Nos. 1 to 4 } THE EDITOR.
- AMERICAN Almanack, 1844. 8vo J. E. WORCESTER, Esq.
- PHILOSOPHICAL SOCIETY.—Proceedings of the. The Celebration of the 100th Anniversary, and No. 26. 8vo. 1843 } THE AMERICAN PHILOSOPHICAL SOCIETY.
- CANADA.—Hochelaga Depicta; or the History and present State of the Island and City of Montreal. 8vo. Montreal, 1839 } THOMAS FALCONER, Esq.
- The Traveller's own Book to Saratoga Springs, Niagara Falls, and Canada. By S. De Veaux. 12mo. Buffalo, 1841 } Idem.
- The Traveller's Guide through the Middle and Northern States and the Provinces of Canada. By G. M. Davidson } Idem.
- CUBA.—Guía de Forasteros en la siempre fiel isla de Cuba para el Año de 1842. 8vo. Havana, 1842 } Idem.
- GREENLAND.—Sur les découvertes faites en Groënland. Par M. de la Roquette. 8vo. Pamphlet } M. DE LA ROQUETTE.
- MEXICO.—Historia de la Conquista de Méjico, &c. Escribáala Don Antonio de Solís. 2 vols. 8vo. Paris, 1827 . . . } EDWARD DOUBLEDAY, Esq.
- Journal Historique du dernier Voyage que fît M. de la Sale ft dans le Golfe de Mexique, &c. Par M. Jodtel & M. de Michel. 8vo. Paris, 1713 . . . } THOMAS FALCONER, Esq.
- TEXAS.—Le Texas et sa Révolution. Par Fred. Leclerc, &c. 8vo. 1840 } Idem.
- Texas and the Texans, or advance of the Anglo-Americans to the South-west. By H. S. Foote. 2 vols. 8vo. 1841 } Idem.
- UNITED STATES.—Second Annual Report on the Geological Survey of the State of Ohio. By W. W. Mather. 8vo. Columbus, 1838 } EDWARD DOUBLEDAY, Esq.
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- 1843.—Mr. W. J. HAMILTON, M.P., [Founder's Medal,] for his researches in Asia Minor.
- Prof. ADOLPH ERMAN, [Patron's Medal,] for his extensive geographical labours.
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PRESENTATION

OF THE

GOLD MEDALS,

AWARDED RESPECTIVELY TO MR. WM. JOHN HAMILTON AND
M. ADOLPH ERMAN.

Addressing the first of these gentlemen the President said :—

“MR. WM. JOHN HAMILTON,—The Council of the Royal Geographical Society having awarded to you the medal of our founder, King William IV., I have great pleasure in explaining the grounds upon which they offer to you this token of their high estimation of your services to geographical science.

“This medal is granted for your successful and well-matured labours upon the physical geography, geology, and antiquities of Asia Minor, Armenia, and Pontus, consigned in a work which has obtained for you a high place among those who devote their services to the advancement of knowledge.

“It is now nine years since you first proposed to examine that region so famous in ancient history, but so little explored by modern travellers.

“To prepare you in clearing away the obscurities which hung over the antiquities of that classic ground, you were, indeed, so fortunate as to have at your right hand your own parent, my esteemed predecessor in this chair, and aptly did he train up his son in the way he should go. His learned suggestions were, I know, the first stimulus to your travels, as they were also the chief means of enabling you to overcome many of the difficulties which were likely to beset your path.

“I know you will pardon what I consider a laudable pride on my own part when I advert to the fact that, in affording you all the geological assistance in my power before you commenced your journey, I made you known to Mr. Strickland, the companion of your earlier travels, whose great proficiency in natural history as well as geology rendered him a fitting person to combine with you in producing a complete work upon the region to be explored.

“Though, owing to a family affliction, your colleague was compelled to return home after a space of several months, the memoirs which were offered in your joint names to the Geological Society, and which have now found a place in its Transactions, are full proofs of the vigour employed in your researches, and of the accuracy of the conclusions to which you both arrived.

“Deprived of your friend—beset with the difficulties which neces-

sarily encompass all explorers of the East, and at one time the victim of severe illness—still were you undaunted; and you held steadily on, in the firm resolve to complete the object of your mission. In proportion, therefore, to the obstacles which you vanquished, ought we to estimate the value of the methods by which you worked out, chromometer in hand, the relative position of numerous places, rivers, lakes, and hills, many of them previously ill laid down upon maps, the zeal with which you amassed specimens of the rocks, and the patience and acumen with which you recognised the sites of several lost cities, by the examination of their inscriptions. And here I may remind the Society of the following important geographical points which you established:—The correct delineation of the course of the Rhyndacus and the Macestus, through the ancient provinces of Mysia and Bithynia; the form of the southern coast of the Black Sea, from Trebisond to Sinope; and the discovery of the site of the mining operations of the ancient Chalybes of Apollonia Rhodius, and of their modern successors; the site of the ancient city of Isaura, and the correct delineation of the Lakes of Trogitis and Caralitis in its immediate vicinity; the map of the Catececaumene, a region which, with your associate Strickland, you showed to be a very counterpart in geological structure to the extinct volcanoes of central France.

"Not satisfied, however, with rendering us familiar with the central and northern portions of Asia Minor, your *reconnaissance* of Armenia, pushed to the foot of Ararat, has had an important bearing both on physical geography and geology; for whilst you determined the height of the plateau of Kars, you proved that, surrounded by rocks of plutonic and 'quasi' volcanic characters, this elevated district (3000 feet above the sea) is essentially composed of beds of marine shells of comparatively recent date—thus showing that a region, occupied by some of the earliest of the human race, had undergone great mutations of outline during one of the most recent geological periods. This phenomenon has since been completely established, in relation to adjacent territories around the Caucasus, by the explorations of M. Dubois de Montpereux.

"Pursuing your inquiries to the S.E., you achieved, amid the hills of Cappadocia, that which must be always considered a real triumph for a field geographer, in being the first to ascend, and correctly to determine, by barometrical admeasurement, the true altitude of Mount Argæus, which you ascertained to be 13,000 feet above the sea.

"In the same region you further established that the river Melas, instead of flowing eastward into the Euphrates, as stated in our copies of Strabo, in reality runs N.W. into the Halys. Again on the borders of Cappadocia and Phrygia, you were the first to explore the shores of the Great Salt Lake, called Kotch Kessa (the Tataa Palus of the ancients), and to prove that, fed by streams which flow through a country of rock salt and gypsum, this mass of water (which has no outlet) owed its saline properties to ancient geological causes. Lastly, you made an important correction of all previous maps, by showing the non-existence of the supposed southern source and branch of the Halys.

"Had these your efforts been but simply announced, they would

alone have entitled you to our grateful thanks; but, unlike the soldier, the geographer cannot win unfading laurels in the field alone. To your laborious survey, you added, therefore, years of patient study, and, by comparing and condensing your observations, you finally produced those volumes and that map which have earned for you the distinction this day conferred upon you. Clear and unpretending in style, the *Researches in Asia Minor* have stood the test of criticism, both at home and abroad, and have elicited from competent judges their warmest approbation.

"In handing to you the Medal, which bears the effigy of the previous sovereign of this nation of real travellers, I am sure I shall render it still more prized by publicly stating, that the illustrious chief of living geographers, Baron Humboldt himself, expressed to me personally his decided opinion, that you were pre-eminently entitled to the honour you have now obtained."

"May you, then, my valued friend, live long to enjoy your well-earned reputation, and may those public men among whom you are now engaged, appreciate as I do the value of researches which, from the clearness of arrangement, ability, firmness, and good sense, with which they were accomplished, are the surest test of your being well qualified to perform the duties of any station in life in which you may be called upon to serve your country."

Mr. HAMILTON, in reply, said—

"Mr. President—In thanking you for the honour this day conferred on me in the name of the Royal Geographical Society of London, and for the flattering terms in which you have announced to me the award of the Founder's Medal, I have the greatest difficulty in expressing the satisfaction and gratitude which I experience in receiving such a distinguished mark of their approbation.

"That my labours in the field, and my subsequent exertions in preparing the result of those labours for publication, should have been considered worthy of such an honour, is, indeed, more than a sufficient recompense for the dangers, difficulties, and disappointment which the traveller who would explore untrodden paths in eastern countries must be prepared to meet with.

"When I consider the high position which the Journals of this Society hold amongst the literary and scientific societies of Europe, I do, indeed, feel proud that my name will henceforth be associated with those who have contributed something towards rescuing from loss and oblivion some of the historical monuments of ancient days, and who have fixed the position of towns whose names were formerly only known through the ancient writings and coins. This medal which I hold in my hand possesses also an additional merit, from the circumstance of its being presented to me by you, whose friendship I have so long enjoyed and appreciated, and from whom I received the first suggestions which directed me towards the classic regions of Lydia and the Catacecaumene.

* In reference to this opinion of Baron Humboldt, I am glad to see that a German translation of Mr. Hamilton's '*Asia Minor*' has recently been published at Berlin.

"But, Sir, after the flattering manner in which you have alluded to what I *have* done, I trust I may be permitted to allude for a few moments to some of the many points which still remain to be investigated in Asia Minor. Amongst these the courses of the rivers are most important, and are the chief desiderata of geographers. The Halyk, formerly the boundary between the kingdoms of Lydia and of Persia, is still very imperfectly known throughout a considerable portion of its course. The drainage of the great central plateau of Asia Minor, extending nearly 200 miles from E. to W., and 150 miles from N. to S., is still only partially known. In the N.W. portion this drainage is effected by the Sangarius, and the several sources of this river also are still unexplored. In the southern and eastern portion of the plateau there is no natural drainage whatever through the ranges of Mount Taurus, which forms an insuperable barrier. The rivers which flow into the plain are either lost in the great salt lake of Kodji Hissar, or are absorbed by evaporation, or they escape under the Taurus into the Mediterranean by means of subterranean passages or *katabothra*. These still invite further examination. The short rivers also, which flow from the south slope of the Taurus into the Mediterranean, are very little known, and their exploration could not fail to lead to the discovery of many ancient sites. It might also be an interesting subject for inquiry how far the sources of these rivers correspond with the *katabothra* on the northern slopes of the Taurus. Allow me to add one word more on the loss I sustained by the necessity which compelled Mr. Strickland to return home, and to which you have alluded. Both as a geologist and as a naturalist he would have added interest to these researches in Asia Minor, and I can only regret that his name is not associated with my own, as a joint author, on the title-page of my volumes.

"Once more, Sir, I beg leave to thank you and the Society for the honour which you have this day conferred upon me, and to say that I consider this medal as the greatest reward which can be bestowed on a British traveller."

On the adjudication of the Patron's Medal to Professor Adolph Erman, the President thus addressed the Society:—

"The medal placed at our disposal by the bounty of Her Majesty, our Most Gracious Patron, has been adjudicated to Professor Adolph Erman, for the very remarkable results in physical geography, meteorology, and terrestrial magnetism, which he has communicated in his work, entitled *Travels Round the World* ('*Reise um die Erde*').

"To sum up the chief merits of Adolph Erman in a few sentences is a difficult task, and yet I must endeavour to point out the great features of his works. If, indeed, I only referred you to the analyses of his labours which have been given in the 6th and 9th volumes of the *Journal* of this Society, you might find in them alone a full justification of the award of the Council. The geographer who has made magnetic and meteorological observations across the great continent of Russia and Siberia, and thence by Kamtschatka round Cape Horn to Europe—who in that long journey, and in excursions to the Icy Sea on the North, and to the Wall of China on the South, correctly determined the altitude

of numberless places, and reformed our ideas of the relative heights and geographical outlines of large tracts, whether near the mouth of the Obe, or in the remote Kamtschatka, must, indeed, have the strongest claims upon practical geographers; and I rejoice in occupying this chair at a time when our Council has thought fit thus to record their sense of the importance of the labours of this distinguished Prussian.

"The outset of Adolph Erman on his adventurous travels—all of them executed at his own expense—recalls to our recollection that day when the Diet or Storting of Norway set a noble example to Europe, in sanctioning the researches of their countryman Hansteen into the magnetic condition of the earth; for during that part of his journey which extended into Siberia, our Medallist was the companion of the eminent Norwegian philosopher.

"In viewing M. Adolph Erman as a magnetician, it would be quite enough for me to state, that my illustrious friend the Baron Humboldt, who more than all others has generalized and enlarged the scope of this science, having by his own observations in Siberia closely scrutinized the data afforded by M. Erman, is unhesitatingly of opinion that they are of the very highest value both in respect to terrestrial magnetism and astronomical geography. At the same time I have a real pleasure in doing justice to M. Erman from the mouths of our own countrymen, by quoting an extract from a Report to the British Association, in 1837, prepared by that very competent judge Colonel Sabine, who has himself so largely extended our acquaintance with this department of science, and who has so successfully co-ordinated the observations of his contemporaries and his own:—

"The complete series of M. Erman's magnetic determinations (says Colonel Sabine) is the most extensive contribution yet made* to the experimental department of magnetical science; nor can we rate its value too highly, since it furnishes us with consecutive determinations of dip, variation, and intensity, by the same highly qualified observer, and with the same excellent instruments, extending through all the meridians of the globe, and from the Arctic circle in Siberia to nearly 60° of south latitude; the whole of this distance being traversed in the course of two years, and the track completely marked by the frequency of the observations.†

"To these remarks I would add, that researches at once so extensive and so exact could scarcely have been made without tending to general conclusions of considerable importance; and those to which M. Erman was led may be stated in his own words, from a communication which he addressed, shortly after his return, to the Imperial Academy of Sciences at St. Petersburg:—

"Ces indications suffisent pour prouver que l'ancienne théorie, qui ne suppose qu'un seul axe magnétique, est absolument en défaut pour les lois de l'intensité de la force magnétique. On peut en tirer la conclusion intéressante, que la position des deux pôles magnétiques n'est pas la seule qui règle les phénomènes dans les différentes parties du

* Extract from Report in the Vol. of the Brit. Association, 1837.

† Since Colonel Sabine's report was written we have had still more extensive contributions from Sir James Ross and the Antarctic Expedition.

globe; mais qu'il existe encore une cause secondaire qui exerce sur les loix de l'intensité une influence si puissante qu'elle en efface presque tous les caractères déduits par la théorie.*

"It is thus most remarkable to find that at this early period (1831) M. A. Erman actually deduced from his own independent observations, conclusions in strict accordance with those which are now generally gaining ground, as the results of the still more extensive researches which have been subsequently undertaken. They are, indeed, anticipations which afford the strongest proofs of the sound reasoning of a truly philosophic mind.

"Next let us view M. Erman as a meteorologist:—

"The knowledge (says the distinguished Bessel) that the mean height of the barometer is not precisely the same at different points strictly at the level of the sea, was first obtained by an investigation by Adolph Erman in 1831, in which he showed, partly from his own observations made in his travels round the earth, and partly from the observations of others in Northern Asia and America, and on board the Russian corvette *Krothoi*, commanded by Captain Hagemeister, first—that in the zones of the trade winds, the barometer stands higher at the boundary most distant from the equator than at the boundary which is nearest to it; and, secondly, that the mean height of the barometer is different in different meridians. The first result rests on observations collected in passing eight times through the zone of the trade winds; and has since been corroborated in Herschel's astronomically-memorable voyage to the Cape of Good Hope. The second result rests on a comparison of observations made in the Atlantic and Pacific Oceans: the differences amount to several lines, and leave no doubt that *the mean height of the barometer at the level of the sea is different at different points of the earth's surface*, and depends on the geographical latitude and longitude of the place.*

"Lastly, if we regard M. Adolph Erman as an astronomical geographer and explorer of distant lands, we must all admit that he stands in the very highest rank. It is in the perusal of such important works as the '*Asie Centrale*' of Baron Humboldt, that the general reader has become acquainted with some of the chief additions he has made to positive knowledge. As a traveller who has merely put his foot, as it were, within the edge of the circle of the Siberian continent, I have, I confess, a sincere admiration for the man, whose unremitting skill and untiring zeal not only carried him through such wild tracts, but enabled him to make the many astronomical observations, which have so essentially enriched and corrected our previous maps. Take, for example, one point alone, in connexion with the Ural chain, of which I have some knowledge. The north-eastern termination of these mountains, where they take the name of Obdorsk, which had long ago been explored by Sujeff, under the direction of Pallas, were placed, upon all our maps, $3^{\circ} 37'$ too far to the E., an error corrected only by the observations conducted by Erman in that barren region, peopled by a few wild Samoyedes. It is, indeed, needless that I should here mention what must be known to you

* Translated from a communication from Bessel, in the *Ast. Nach.*, Nos. 356, 357.

all; that, previous to the travels of this enterprising geographer, we were most imperfectly acquainted either with the physical geography or structure of large portions of Eastern Siberia, whether on the frontier of China or on the shores of the Pacific. Traversing the easternmost regions of Siberia in sledges drawn by rein-deer or dogs, and therefore compelled to travel with small quantities of baggage, M. Adolph Erman was necessarily prevented from transporting with him any cumbrous specimens; but from small fragments of the rocks which he brought back from the Alden mountains, which he determined to have a maximum height of 4216 feet (a collection which I have had the privilege of inspecting), there seems no doubt of the extension of palæozoic and eruptive rocks in that meridian chain, similar to those of the Ural. To the importance of this discovery I shall hereafter advert, when speaking of the probable extension of the gold ores of the Russian empire.

“By his exploration of the volcanic region of Kamtschatka alone, M. Adolph Erman has gained for himself a passport to posterity; since he not only ascertained that volcanoes there range in height from 8000 to near 16,000 feet above the sea, with currents of lava which cease in their descent far above the line of vegetation, but he also made most important corrections in the previously-received latitudes of that peninsula, whereby its form has been greatly changed upon all our maps.

“Thus I have already said much more than enough to convince any one who had not studied the works of M. Erman, that the Council has most wisely selected him to be the receiver of our Patron's medal; and there can, indeed, exist no doubt that, with the exception of the great Humboldt himself, it would be difficult, if not impossible, to find a single man in the broad field of explorers, not already honoured with our medal, who is more richly deserving of it.

“Well may Prussia boast of the geographical triumphs she has won, through the exploration of unknown tracts, by her Humboldt and his disciples, Erman and Schomburgk, whilst she points to her Ritter and her Berghaus, as the historical and learned geographers who carry the results of their studious researches from their closets in Berlin into the most distant regions of the globe.

“Had the Chevalier Bunsen been in England, I am certain he would have honoured us with his presence as the representative of the enlightened and beneficent monarch of a kingdom which has given birth to such men, and would have rejoiced in receiving from us the medal for his distinguished countryman, Adolph Erman.”*

Since the Anniversary, the following reply has been received from Professor Adolph Erman to a letter in which the President announced to him the award of the Council:—

“Allow me to request your kind intervention in expressing to the Royal Geographical Society my warmest thanks, and the extreme though

* Baron Von Thile, the resident Prussian *Chargé d'Affaires*, expressed to Mr. Murchison his great regret at being absent for a few days from London at the period of the anniversary; but the Chevalier Hebler, the Consul-General, attended the anniversary dinner, when the President delivered to him the medal for M. A. Erman.

rather diffident pleasure with which I received the medal they have been so obliging as to award to me.

"Although in his search after truth itself, a real lover of science finds his greatest pleasure, he must still be occasionally troubled by doubts of the utility of the results he has obtained, and of the success which attended their publication.

"No honour, therefore, could be more gratifying to an old employer of Hadley's sextant than the adjudication of a medal adorned with the representation of that noble and powerful instrument—a medal conferred under the patronage of so great and amiable a Queen, by a Society which, of all others in Europe, is most competent to decide upon the performances of that English invention.

"But as rewards too liberally bestowed are apt to cool or relax the zeal of the receiver, I feel myself compelled to assure your Society that their indulgence towards my former attempts in science shall only act as a spur to a further employment of all the means or strength I may possess."

ADDRESS

TO THE

ROYAL GEOGRAPHICAL SOCIETY OF LONDON;

Delivered at the Anniversary Meeting on the 27th May, 1844.

BY

RODERICK IMPEY MURCHISON, Esq., V.P.R.S., &c.
PRESIDENT.

GENTLEMEN,—At the last Anniversary, when by your kindness I was elected President of this Society, I was travelling to collect additional materials for the completion of a work upon the geological structure of Russia and the Ural Mountains; and in now thanking you for the high honour you conferred upon me, I allude to that circumstance, and to the work, in which I am still incessantly engaged, in the hope that you will therein find some excuse for the deficiencies which must pertain to the following pages, if compared with the discourses of my more learned predecessors. Their perspicuous, general, and systematic views have, indeed, so thoroughly unfolded and explained all the leading objects of the Royal Geographical Society, and you are so penetrated with their truths, that it would be unbecoming in me, even if I had the power, to re-enact a part which could only be required when you were beginning to take your place among other scientific bodies.

Originating thirteen years ago amid a few travellers of the Raleigh Club, of whom, I am proud to say, I was one, the Geographical Society of London has now reached that age when it no longer stands in need of any appeal to principles explanatory of the nature and design of its researches—the value of which is, I trust, justly estimated by the British nation. A narrative of the progress of our science in the past year is, in truth, the only dissertation you require, which, whilst it brings before you, in one view, the recent acquisitions to geography, enables your President to express his own opinion upon subjects which

have occupied his thoughts, and leaves you free to comment upon others with which you are more conversant than himself.

Before, however, I turn to the long register of geographical discovery in various parts of the world during the past year, I must congratulate you on a new and pleasing feature which marks this Anniversary. You have doubtless listened with great satisfaction to the Report of the Council, which states, that our ranks have been swelled by many new members, among whom are persons the most distinguished in the land. First stands the name of the Consort of our gracious Patron the Queen, who, with that kind condescension which characterizes His Royal Highness, has been pleased to accede to the unanimous wishes of the Council, that he should occupy the post of Vice-Patron, vacant by the decease of His Royal Highness the Duke of Sussex. The warm interest which Prince Albert has evinced for letters and the arts, and His Royal Highness's good taste in patronizing them, have already been appreciated by the public; but those posts in science which were befitted to his exalted station being held by that true friend to the extension of knowledge, the Duke of Sussex, it was only upon his demise that His Royal Highness Prince Albert had the opportunity of publicly testifying his respect for our pursuits. The enrolment of Prince Albert as our Vice-Patron must therefore be viewed, not merely as a proof of His Royal Highness's good will, but also as the harbinger of our rise in the opinion of the British people, by whom he is so justly beloved.

In referring you to the copious list of new members, I beg also to mention the names of three men of science, whose assistance and co-operation must be considered of good augury: the Marquess of Northampton, the Earl of Rosse, and Sir Henry T. De la Beche.

The first of these valued friends, long known as the warm promoter of many branches of science, and worthily presiding over the Royal Society, has, I assure you, both a true love for our occupation and many characteristics of a physical geographer; for his Lordship possesses, in an eminent degree, the powers of correctly delineating natural outlines, and of determining the nature of the minerals in the earth.

The second, putting into action his high attainments in mathematics, astronomy, mechanics, and chemistry, has rendered himself conspicuous by his manufacture—aye, gentlemen, and, to a great extent, by his own hands—of a reflecting metallic telescope so colossal, that it will enable him, I trust, to lay down, with infinitely greater precision and detail than were formerly practicable, the external form of our nearest neighbour in the planetary system. And as geographers could not have fixed the relative positions of places upon the earth, without an acquaintance with

the celestial bodies, so may the Earl of Rosse, reflecting back terrestrial knowledge upon the moon, and tracing therein the shape and dimensions of mountains, vales, fissures, and volcanoes, be justly said to have earned for himself the title of the "Selenographer" of modern science. Is it not indeed to be wished, that before our next Anniversary we may be enriched by some communication from our new member, in which he shall compare with forms of the earth to which we are accustomed, those rugosities of the sister planet, in which he will doubtless make many new discoveries?

Thirdly, I hail the accession of Sir Henry T. De la Beche, the Director of the Ordnance Geological Survey, whose daily pursuits are intimately connected with our own. When I know that he is incessantly labouring more efficiently to co-ordinate precise geometrical formulæ with geological phenomena, and to establish more correct drawings of outline as dependent on physical causes—when I see that in his hands the Museum of Economic Geology, whether as respects natural products or the works of man, is becoming an emporium in the broadest sense of the word "geographical," I cannot but rejoice that my old associate, in a branch of science so closely akin to our own, should have completed the triad of leading scientific men who have this year joined our ranks. Aply as such persons may assist us, their alliance is, however, doubly valuable for the proof it holds out to the public of the real value and utility of the Royal Geographical Society.

OBITUARY.

Though the nature of this Address precludes a lengthened dissertation, in which justice can be done to the memory of all our deceased members, many of whom, distinguished as they may be in public or private life, have not rendered contributions to the storehouse of science, a few expressions of sorrow and regret for the loss of travellers and geographers during the past year, and some allusion to their merits, form a necessary duty of the President of this Society.

At the head of this list I place the name of John Bacon Sawrey Morritt, who died at his seat of Rokeby in Yorkshire on the 12th of July, 1843, and in the seventy-second year of his age. Highly educated as a classical scholar, Mr. Morritt became conspicuous in early life by his travels in Greece and Asia Minor, a portion of which countries he critically illustrated in a work upon the Troad, which, from successfully combating the opinions of Mr. Bryant, who contended that the "*fuît Ilium*" was a fable, obtained for him the honourable sobriquet of "*Troy Morritt*."

Serving his country during a long period, both as a magistrate and a member of Parliament, Mr. Morritt never relaxed in his pursuit of antiquarian and historical lore, and was for many years an active contributing member of the Dilettanti Society, whose meeting room is now ornamented with an admirable portrait of their lamented associate, from the pencil of Sir Martin Shee. The object of the researches of this Society, it may be observed, has been, in a great degree, congenial with our own; as to them we owe the antiquarian missions sent into Asia Minor, under the conduct of our distinguished associate, Mr. C. Fellows, for the purpose of identifying the sites of ancient cities, and illustrating their history by their monuments. The gentleman whose memory I am now bringing before you, gave to the Dilettanti Society the advantage of his extensive classical knowledge, and of his acquaintance with art, by the preparation of two learned dissertations on the sculpture of the ancients, which are prefixed to the second volume of their work, entitled '*Specimens of Ancient Sculpture from different Collections existing in Great Britain,*' and which was published in 1835.

Equally imbued with a love of national poetry, Mr. Morritt has, indeed, already become one of the "English Worthies," as the long-tried and chosen friend of Sir Walter Scott. The place which he embellished by his taste is now classic ground, through the poem of '*Rokeby,*' whilst the eloquent biographer of the great Scottish bard has led every one to know how these boon companions "climbed the hills together."

Any one who like myself had the delight of being intimately acquainted with Mr. Morritt, and of living with him amid the shades of *Rokeby*, can testify that in freshness of mind and memory, and in the talent of reciting tales of the olden times, he was the very counterpart of his illustrious friend. Learned without pretension—witty without display—generous and hospitable without ostentation, he was an excellent specimen of a class now, alas! fast fading away—the Old English Gentleman. Happy are they who pass through life with such a friend!—and worthily has this good and virtuous man enabled his survivors to say, that so long as the name of Scott is venerated, so long will that of Morritt be honourably remembered.

One other English geographical traveller only, Mr. George Lloyd, is deceased, and he has to be mentioned as the editor of the papers of the late Captain A. Gerard. This fine young man was accidentally killed on the 10th of October last near Thebes by the bursting of a fowling-piece.

Mr. Nicollet, a celebrated American geographer, by birth a French-

man, died at Washington in October. Among his other works I may particularly mention his map embracing the whole of the Mississippi north of the junction of that river with the Missouri; the Missouri, to the distance of more than 1200 miles from its mouth; the country below the Mississippi, and the Lakes Michigan and Superior, to the 49th degree of lat., a region said to have been by his exertions more completely examined, and of which the map is more minute than that of any other part of America. Mr. Nicollet was a physical astronomer as well as a geographer; he was the favourite pupil and friend of La Place, and his name is frequently mentioned in the '*Mécanique Céleste*;' he was also attached to the study of geology and ethnology. His death is said to have been caused by his application to the requisite calculations for the map to which I have alluded.

Mr. Hassler, another American labourer in the field of geographical labour, died in November last, while engaged in the survey of the American coasts, the continuation of which undertaking is now confided to Mr. Dallas Bache, well qualified, it is said, for the task.

M. Simons, a Belgian engineer, and corresponding member of the Royal Academy of Sciences of Brussels, died on his passage to St. Thomas, where he had been appointed director of the colony, and whence he was to have sent home an account of his scientific observations.

Our correspondents in France have lost two leading men in M. Sylvain F. Lacroix, a celebrated mathematician, author of a memoir on physical geography, and in M. Guillaume Barbier du Bocage: the latter was one of the founders of the Geographical Society of Paris.

I have also sincerely to deplore the loss of Major Emile Le Paillon de Boblaye, Vice-President of the Geographical Society of France, who to the qualifications of a good engineer added those of a very sound geologist. Employed extensively in the preparation of the great map of France and the survey of Algeria, Major de Boblaye is best known as the author, in conjunction with M. de Virlet, of a most instructive large work on the geology and mineralogy of the Morea, which forms the second volume of a splendid publication undertaken, like many others, to its great honour, at the sole expense of the French Government.* The death of M. de Boblaye has occasioned deep sorrow among many geologists and geographers, by whom he was as much beloved for his excellent social qualities as for his very high attainments.

In our own body I have fortunately not to record the death of a single

* *Expédition Scientifique de Morée.*

British geographer, notwithstanding what may be termed the risks of the profession. We have, however, to regret the decease of Sir Henry Hallford, President of the College of Physicians, and Lord Abinger, Chief Baron of the Court of Exchequer, both members of our Society, and both eminent in their respective walks of life.

ENGLISH PUBLICATIONS.

In the review which I shall now take of the progress of geography in the last year, I naturally commence with a brief account of British travels, surveys, and explorations.

Among the volumes directly connected with geography which have been published in our country during the past year, exclusive of communications to our own Society, I may mention the '*Personal Observations on Scindh*,' by Capt. Postans; a translation from the German of a '*Description of Kordofan, and some of the adjoining Countries*;' the '*Journals of the Missionaries Krapf and Isenberg in Abyssinia*,' and '*the Highlands of Ethiopia or a Mission to Shoa*,' by Major Harris. The two last-mentioned works will be subsequently alluded to in a review of the different explorations of Abyssinia.

But besides these, there are two publications upon Asia, and one upon the Alps, which specially call for notice; and of these I will first speak of the '*Historical Geography of Arabia*,' by the Rev. Charles Forster. The object of this very learned work is to ascertain, in the first place, from the earliest records to which we have access,—namely, those of Sacred History—the different positions which were occupied by the original settlers; secondly, to trace the several ramifications of these primitive tribes, as they extended themselves over the other parts of the Peninsula, by aid of the lights which a critical examination of the writings of the classical geographers, as well as of native authors, have enabled him to throw upon the subject; and, finally, he has illustrated the conclusions which he has drawn from these sources by a reference to the works of the most celebrated modern travellers, whose narratives supply him with many arguments in confirmation of the localities, which he has been led to assign to the different tribes, the inhabitants of which are found still to exhibit the indelible traces of the parent stocks from which they descend.

It may appear, from the imperfect sketch that has been here given of it, that Mr. Forster's work belongs more properly to the province of ethnology. It is, however, throughout, so intimately connected with subjects of geographical inquiry that it claims to be honourably men-

tioned on this occasion, when we are commemorating the progress of that science during the past year. The discussions which it contains upon many controverted questions in this department—such as the country of the patriarch Job, the situation of Ophir, of Sheba, &c., and the course of the Roman expedition into the interior of Arabia, under Ælius Gallus—are treated of with an extent of learning, and a facility of applying it to the point in question, that are rarely to be met with.

And here, though it may be somewhat more foreign to our present purpose, I cannot omit to mention what is perhaps the most striking result of Mr. Forster's researches. I allude to the discovery he has made of a key to the unknown language in which the inscriptions found in Hadramaut, and other parts of Southern Arabia, are written. It has been applied successfully to the interpretation of those of Hisn Ghoreb and Nakob el Hajar, mentioned in the 7th and 8th vols. of our Transactions, and likewise to one since discovered at Aden. The method of interpretation was only perfected when the author's work was nearly printed off: much, therefore, that relates to it has been added in an Appendix; and though its value could only be tested by applying it to the limited number of inscriptions, of which he possessed accurate copies, the facts which these are found to record are sufficiently important to awaken the liveliest interest in the further prosecution of the subject. Additional materials for it will no doubt be collected by future travellers in that country, whose exertions will be stimulated by the hope of rescuing from destruction these memorials, which have been for ages unintelligible, and which, by the help of the extraordinary discovery now announced, may be found to contain the earliest contemporaneous records in existence.

The second work, the 'Narrative of a Journey from Herat to Khiva, and thence to Moscow and St. Petersburg,' by Capt. James Abbott, does not demand a long analysis, since the very difficult and peculiar situation of the author, whose mission was purely political, prevented him from adding much of geographical importance to our previous knowledge of those wild countries. This narrative affords, however, a striking example of what the energy, perseverance, and firmness of our countrymen can effect under the most trying circumstances, and gives us a sure earnest of how this gallant officer was destined to distinguish himself in the subsequent wars of Afghanistan. Suspected and betrayed by the Khan of Khiva—pillaged and severely wounded by the savage Turkomans, he still contrived to reach the Russian outposts on the Caspian Sea; whilst in passing over the dreary and desolate plateau of the Ust Urt, he made us acquainted with some facts respecting the extension of the Caspian in a former period, to which I shall afterwards

allude. In the Appendix to his work, Captain Abbott also gives a sketch of the manufacture of damasked steel prepared at Zlataust, in the Ural mountains, which I recommend to the perusal of all persons interested in the improvement of this branch of art. Thoroughly versed in the Asiatic methods of preparing steel, he has given a very clear account of the method by which that able officer, General Anosoff, has surpassed all his contemporaries in so uniting the properties of ductility and hardness as to produce the most clean-cutting scimitars. Having myself visited the same establishments in the Ural Mountains, and having been honoured with presents of their productions, including works of inlaid, engraved and embossed steel, prepared by a revived and improved Asiatic method, which have excited the admiration of my countrymen, I must express the high gratification I felt in perusing the sketch of Captain Abbott, who, entering Russia during the period of the war between that country and Khiva, and consequently under circumstances of peculiar difficulty, was yet received with as much kindness as every other Englishman; and he left the country, like myself, deeply impressed with a sense of the generous hospitality of the Russian nation.

The third and last work, published in England, upon which I shall now comment, is that entitled, 'Travels through the Alps of Savoy, and other parts of the Pennine Chain; with Observations on the Phenomena of Glaciers,' by Professor James Forbes. Following in the wake of De Saussure, the great natural historian of the Alps, our eminent countryman, visiting the snowy regions of the Alps during several years, and carefully studying their phenomena, was finally led to propose a theory of the formation and movement of glaciers, which, in sustaining some of the leading views of his great master, seems, under certain physical conditions, to be a nearer approach to the truth than anything which had been previously propounded.

In applying to the motion of glaciers the most careful observations and admeasurements, Professor Forbes has clearly established two facts entirely subversive of the theory of their movement by expansion within themselves: first, that the rates of motion near the upper and lower extremities of a glacier are approximately equal; and, secondly, that the motion in winter, though less than that in summer, bears a considerable proportion to it. Hence Professor Forbes infers that gravity must be the primary cause of the motion. A profound mathematician, Mr. Hopkins, of Cambridge, had arrived at the same conclusion, not by a study of the Alps, but by ingenious experiments at his own home, whereby he showed that ice will descend, by the action of gravity,

down planes of very much smaller inclination than that of any known glacier which has been observed in motion; and has thus removed the only serious difficulty which ever existed in the gravitation theory. Whether the component parts of a glacier be analogous to a viscous fluid, as suggested by Professor Forbes, or be made up of loose fragments of ice (the opinion of Mr. Hopkins), which, in advancing, must have all the pliability of such a fluid body, is a question I am not able to decide. Nor can I pretend to do justice to a curious discovery of Professor Forbes, of the laminated structure of ice, as indicated by lines of colour—a structure which may eventually serve to throw light on the crystalline arrangement of rocks.

I cannot, however, take leave of this beautiful and instructive work without saying that, even in strict reference to physical geography, it has strong claims upon our consideration; for, independent of correct drawings of the outline of many peaks and valleys of the Alps, the corrections of Keller's general map of the Pennine chain are most important, whilst the detailed map of the 'Mer de Glace,' and the mountains around Chamouni, is a striking proof of the topographical skill and accuracy of Professor Forbes, without which his reasoning could not have been applied, nor his deductions established. I may here mention that, in revisiting the Alps last summer on his way to Italy, this powerful natural philosopher obtained fresh proofs of the accuracy of his views, which he has since recorded; and I rejoice to learn that his health, which was to some degree impaired, has been greatly restored.

ENGLAND—*Maritime Surveys.*—To a maritime nation like ours, nothing being of greater importance than correct charts, I shall commence my notice of the progress of British geographical labours, during the past year, with an account of the nautical surveys under the direction of the Admiralty, obligingly furnished by our eminent associate, the Hydrographer Royal, Captain Beaufort.

Captain Bullock, of the *Tartarus*, to whose preceding labours in the river Thames allusion has been made in the Anniversary Addresses of the two last years, is now employed in the examination of the channels leading into the mouth of the river, and those through the Downs, where a considerable change has taken place in the position of the Brake and other banks.

Captain Washington, formerly our excellent Secretary, and now commanding the *Blazer*, is still employed in the North Sea, the survey

of the southern part of which, already extending over 6000 square miles, has been published. It gives the position of all dangerous banks, and enables the seaman to find his way at night or in a fog, by means of the soundings, of which there are more than 20,000 in the single sheet. Such a submarine survey of the most beaten watery track in the world is a benefit to the seamen of all nations. The survey will be continued by Captain Washington farther to the northward, and towards the entrance of the Baltic; and occasionally he is engaged in correcting the charts as nature changes the positions of the shoals and the directions of the channels. Singular instances of such changes have lately occurred in Yarmouth Roads, through which so many thousand vessels annually pass.

Commander Sheringham, in the *Fearless*, has completed his elaborate plans of Portsmouth harbour, Spithead, St. Helens, and of that dangerous reef called "the Oars;" and in the ensuing season he will survey Southampton River, and advance towards the Needles. The Oars, or Owers—a rock visible only at neap tides, and on which a lighthouse is built—is a remnant of the strata of the cretaceous system which, in a former condition of the globe, must have spread continuously from Sussex and Hampshire to the Isle of Wight.

SCOTLAND.—Lieut. Otter has already rounded the N. point of Great Britain, and, now advancing to the westward, will, it is hoped, turn Cape Wrath before the end of the approaching season; whilst Mr. G. Thomas, in the *Mastiff*, has been for some time engaged in the survey of those two intricate groups, the Shetland and Orkney Islands. The survey of that northern British sea is of great maritime value; for, notwithstanding the construction of the Caledonian Canal, executed at so large a public expense, with the view of escaping from the risks of the northern *détour*, the greater number of mariners, anxious to save the heavy charges of the canal, encounter the dangers of the currents between the Orkneys and the main-land, and of the projecting rocky headlands of that iron-bound coast. So long as no correct triangulation of Scotland existed (and this national reproach has only been removed within these very few years), many of these headlands were inaccurately laid down; and with such very imperfect charts as heretofore existed, we can feel no surprise at the former loss of life, or at the exaggerated estimate of the dangers of the northern passage. However, with the combined efforts of the Ordnance survey, and those of our naval surveyors, the risks and hazards of the Fitful Head will be greatly lessened. Finally, in speaking of the Scottish seas, it is to be observed that Commander Robinson, in the *Shearwater*, having nearly completed

the avenues to that great commercial arm of the sea, the Frith of Clyde, as well as Loch Goil, is now preparing to proceed along the shores and islands to the Mull of Cantire.

IRELAND.—Commander Frazer, in the *Comet*, is now completing the survey of the Irish coast from Wicklow to Wexford, and of those proverbially dangerous banks off Arklow, the position and limits of which have never been accurately examined.

Commander Wolfe, having minutely examined the Shannon from Termonbany, and through the Lakes of Ree and Derg, charts of all of which have been published, has recently surveyed the harbour of Cork, from whence he will proceed towards Kinsale and Cape Clear, while another party is preparing for the western shores of Sligo, Galway, and Clare.

The Irish Channel, so much frequented, and where vessels are so often obliged to feel their way, by the alterations of its depth, had long been suffered to remain without a single correct chart of its soundings; but Captain Beechey, in the *Lucifer*, has now completed a valuable survey of its northern half. The southern portion will be undertaken next summer, and, when finished, will be an invaluable boon to the navigator.

FOREIGN SURVEYS.—*Mediterranean.*—Commanders Graves and Brock, in the *Beacon* and *Magpie*, who have for some years past been occupied in the examination of the islands of the Archipelago, the shores of Greece and Asia Minor, and the coasts of Crete and the Cyclades, from which the navigator, geologist, and classic geographer have obtained so much solid information, are now continuing their labours on the islands of Candia and Cyprus. Independently, however, of his maritime survey Captain Graves will ever be remembered by all lovers of natural history and geological science, as the friend who induced Professor Edward Forbes to accompany him during a part of his labours. By dredging the bottom of the *Ægean* and adjacent seas with Captain Graves, that eminent naturalist, showing us how animals living during the same period of time differ from each other at different depths, has also defined the conditions of sediment and depth at which animal life ceases, and has thus opened a new vista into the hitherto-obscure causes for the absence of shells and other organic remains throughout great masses of sedimentary deposit, and their occurrence in certain bands only.

I am rejoiced to learn that, since the return of Professor Forbes from the *Ægean*, Captain Graves and his officers have pursued these researches with vigour and great success. During the survey of Crete,

in 1843, collections of considerable extent, as well as copious notes and drawings, in zoology, botany, and geology, have been made on board the *Beacon*: thus developing the natural history of the southernmost European lands, previously so ill explored, whilst the dredge has been actively going at great depths, with the view of completing the observations already recorded, or about to be published, by Professor Forbes.

Azores.—This interesting group of islands, though lying in the homeward track of almost all foreign-going vessels, had never been surveyed till undertaken by Captain Vidal, in the *Styx*. A correct chart of them will be a great benefit to all navigators, and especially to the West India steam-packets; and there is good reason to believe that the whole will be achieved this season, through his zeal and activity.

Gulf of Fundy.—The number of dangers in this Gulf, and the unusual strength of the tides, which rise and fall 60 feet, render it very desirable to have a skilful survey made of it, as well as of the navigable river of St. John. Some progress was made therein last year.

Coast of China.—Captains Sir Edward Belcher and Collinson, in the *Samarang* and *Plover*, without whose zeal and skill, as was well observed by my predecessor last year, the British fleet would never have appeared before Canton, or reached Nankin, are still unravelling the intricate navigation of the coast of China, and are constantly sending home hydrographic information of the greatest importance to our Indian navigators.

While these important labours of our naval officers are carried out in various parts of the world, the Hydrographic Office, under the skilful and scientific direction of Captain Beaufort, is equally active in publishing the results of such surveys. No less than 120 sheets of charts and plans have issued from the Admiralty since this time last year, all of which have been most liberally presented to the Society by the kindness of the Lords Commissioners.

British Charts and Maps.—Besides the maritime charts of the Admiralty, to which I have already alluded, there have been published:—

The last sheets of the *Atlas of the Society for the Diffusion of Useful Knowledge*, in which our associate Capt. Beaufort has taken so leading a part.

The map with which this series concludes is a geological illustration of England by myself, and therefore I say nothing of it, except that I have endeavoured to prepare it according to the most recent principles of classification, and that from its convenient size and very small price it may be found an useful *Vade Mecum* for the general traveller.

A sketch of the N.W. coast of Borneo, showing the approaches to

and entrance of the River Sarawak, surveyed by Mr. J. S. Hobbs, commander of a merchant-vessel belonging to Messrs. Melville, Wisc, and Co., who have published the chart.

The National Atlas of Historical, Commercial, and Physical Geography, by A. K. Johnston, Edinburgh.

Ordnance Survey.—During the last year the sheets Nos. 88 and 89 of the Ordnance Survey of England and Wales have been published on the scale of 1 inch to a mile, and the engraving of the county of Lancaster has been commenced on the scale of 6 inches to a mile. The survey of the county of Wigton in Scotland has also been commenced on the scale of 6 inches to a mile. Maps upon this extended scale, you are well aware, are of the greatest value in all those tracts where the sub-soil contains metallic ores, or coal and limestone.

The town-land survey of Ireland on the six-inch scale is complete, and all the counties are published except those of Limerick, Cork, and Kerry. Among those published last year was the county of Dublin, the publication of which had been suspended to await a special act of parliament for the arrangement and legalization of its territorial boundaries. The engravings of this county are remarkable, among other particulars, from the sheet which contains the city of Dublin being printed from an electrotype plate. This process of electrotype was adopted in the Irish survey for the preservation of original plates, and for the insertion of contour lines, as early as 1840; but the instance in question is noticed as another application of this useful art. The city of Dublin was surveyed and engraved in 1839, but while the publication was suspended numerous local alterations had taken place. In some parts of the map many alterations were required within a square inch, and persons familiar with the process of engraving well know that such numerous erasures, if made in the usual way by scraping the copper-plate and hammering up a new face, would, in work so crowded, have nearly obliterated the whole engraving, the re-engraving of which would have been both tedious and expensive; but the electrotype afforded the means of effecting the object in the neatest manner, by erasing from the "matrix" the exact lines to be corrected, so that the "new plate" became blank in those spots, on which the engraver with the utmost nicety inserted the precise quantity of new work required, and no more. By the same means the "Castle Street" of Dublin, on the five-feet scale, has been brought up to the present state of the town. A copy of each of these sheets has been presented to our library.

The maps which accompanied the late census of Ireland were, by permission of the Government, engraved during the last year at the Irish

Survey Office, and they afford another example of the application of electrotyping process; the outline or topographical basis of towns, rivers, and names being engraved on one plate, as many copies were procured by the electrotype as were necessary to exhibit the different classes of observation; on one the relative diffusion of education, on another of house accommodation, on another of farming stock, and on another the relative density of population.

The facilities which the applications of electrotype now practised on the Irish survey afford for the alteration and renewal of maps from time to time, and the insertion of separate classes of information on successive plates, cannot fail to be of great use to the progress and diffusion of geographic knowledge.

During the last year the valuable addition of lines of equal altitude, or contour lines, which was in progress for the Irish maps, was suspended by the Board of Ordnance, as well as the geology and the topographic memoirs; but the revival of all these works has been recommended by a commission appointed by Sir Robert Peel.

The method of contouring, on which I shall presently offer a few remarks, is so imperatively required in the present condition of Ireland, that it pressed itself on the consideration of the British Association for the Advancement of Science which met in Ireland last summer; and the council of that body lost no time in appointing a committee to communicate with the Government and solicit its renewal. There can be little doubt therefore that, so supported, the order for its continuance will be renewed.

A series of lines of level which cross the island in every direction was brought to a close during the last year; these lines, with the tidal observations made at their extremities, are now in process of reduction. The observations were carefully made at every five minutes during two complete lunations, and as the zeros of all these tide stations are known in reference to each other, the results will be considered interesting to the tidal question generally.

This extensive and accurate system of levels has also an important bearing on physical geography; for when the altitudes of so many points on the coast, and a still larger number in the interior are known in relation to each other, it will only be necessary that our successors should repeat any convenient portion of this operation at a future day, to discover what motion has taken place in that portion of the crust of the earth. A mere glance at these important advances must therefore induce us to rejoice that this department of our science continues to be under the direction of Colonel Colby, and that he is so admirably se-

conded in Ireland by Capt. Larcom. You will not fail to have observed that the highly useful application of the Ordnance Map to separate classes of information, is an adoption of the suggestion made by my predecessor Mr. Greenough in his anniversary address for 1841.

Sir James Ross.—Although, gentlemen, it is well known to you that Her Majesty has been pleased to confer on Captain James C. Ross the honour of knighthood, I consider it a duty publicly to express from this chair the great satisfaction which is felt by the Royal Geographical Society at this act of justice towards Sir James Ross, who in his late most hazardous explorations in the Antarctic Ocean has added another to the many glories achieved by the British navy. The results of the Antarctic expedition being of the highest interest to science, the Government has not been backward in tendering assistance for the publication of a detailed account of the voyage; and they have given 1000*l.* towards the expenses of the undertaking. The botanical part will be under the direction of Sir Wm. Jackson Hooker, and the zoological under that of Dr. Richardson. The magnetic observations are, I believe, confided to Colonel Sabine. The personal narrative will of course be executed by Captain Sir J. C. Ross himself. The work is expected to be ready by the end of the year.

RUSSIA.—St. Petersburg.—With the progress of knowledge, a division of labour has become imperatively necessary in various departments of the physical and natural sciences, and on all sides societies have been established for single or monographic purposes. Until very recently, however, few or no efforts had been made to separate physical researches, properly so called, from those of the astronomer; and, remarkable as it may appear, all observations on terrestrial magnetism and meteorology have hitherto been left to men, the chief portion of whose time and attention was necessarily devoted to entirely different subjects. Under the regis of Humboldt, however, and through his researches combined with those of Hansteen, Erman, Sabine, Ross, Kupffer, and others, meteorology and terrestrial magnetism have assumed a separate and most important bearing. Observations have been steadily carried on in different parts of the world, and those who wish to obtain a conception of the breadth and importance which they have assumed, have only to consult the admirable works of our countryman Colonel Sabine, whether in the Transactions of the British Association, or in his own volume. At the suggestion of Baron Humboldt the Emperor of Russia not only directed magnetical observations to be made at all the astronomical observatories, but also at many other desirable spots within his empire. Following out and developing the project of this great man, the same

monarch has just given his sanction to the formation of a physical observatory—completely distinct from the splendid astronomical observatory of his metropolis—in which all the local observations over his vast empire are to be centralized and reduced, under the directions of that profound mathematician and magnetician M. Kupffer.

In this noble undertaking His Imperial Majesty has set an example which ought to be followed in other countries. At home we have, indeed, to some slight degree, endeavoured to establish a separate observatory for physical science in the Royal Observatory of Kew, and which, if the funds were adequate, would, under the guidance of Sabine and Wheatstone, be of utility and importance. At the same time it is imperative upon me to state, that if all astronomers should imitate our distinguished astronomer royal in the ardent and well-regulated method of observation in terrestrial magnetism which he so successfully carries on at the Observatory of Greenwich, no sort of reflection could be cast upon our country for being behind other nations in this branch of science.

SIBERIA.—Northern Siberia.—My predecessor announced to you in his last address that Mr. Middendorf had commenced his journey into Northern Siberia. The objects of that journey have been effected, and we owe to the eminent navigator, our honorary member, Admiral Von Krusenstern, a copy of Mr. Middendorf's personal narrative—a narrative which proves that in this, as in the case of Wrangel, Golowkin, and numerous other explorers, zeal and perseverance, under the most trying circumstances, and courage superior to every danger, are salient points in the Russian character.

The object of the Imperial Academy of Sciences in recommending the journey of Mr. Middendorf was to obtain correct knowledge of a vast region, quite unknown, extending from Turukansk, on the Ienisseï, eastward, to the Khatunga, and northward to the sea. The coast had, indeed, been visited, but nothing was known of the interior of the region, of its productions, and of the limit of organic life in these ice-bound climates. The conduct of the expedition was confided to Mr. Middendorf, and, as no account of the expedition has appeared in English, a few details of it may be acceptable on the present occasion.

The expedition left Turukansk on the 23rd of March, 1843. The party, their provisions, and materials for the construction of a boat, were conveyed down the frozen Ienisseï on sledges, drawn first by dogs, and then by reindeer, belonging to the Ostiaks and Samoyedes. Leaving the Ienisseï, and transported with rapidity from one Samoyede encampment to another, over the "Tundra," or frozen marshes, crossing the Piassina, and ascending its tributary, the Dudypa, they reached

the basin of the Khatúnga. Here they met with fewer resources than they expected, and, with the exception of Mr. Middendorf, and his travelling companion, Mr. Branth, they were all seized with a kind of measles, and disabled from working. At this place, on the banks of the Boganida, a tributary of the Khatúnga, Mr. Branth commenced his meteorological observations, while Mr. Middendorf reconnoitred the Khatúnga, down which river he intended to descend in the summer. Here he found no boat suitable for his purpose, nor any wood wherewith to construct one. The people he met with were, moreover, all ill of the same distemper by which his own party was attacked, but these latter, on his return, he found so far recovered as to be able to work; and, having discovered a few trees, a day's journey to the south of their resting place, the party began the construction of a boat of twelve feet keel, an operation of which none but Mr. Middendorf himself had the slightest idea. He now divided his people into two parties, one of which he left under the command of Mr. Branth, on the Boganida, for the purpose of collecting the animals, &c., of the country; and, taking with him the other party and the skeleton of the boat, and eight sledges drawn by sixty-eight reindeer, he started on the 7th of May, in company with some Samoyedes, towards the Taïmyr river, by which he hoped to gain the coast. The tribe which, after various difficulties, he was next to meet with were found to have been attacked by the fatal epidemic of the country, and, with the exception of thirty-five, all had died, and of these survivors all save one were ill. Mr. Middendorf's medical skill restored them; but as, from their illness, the women had been unable to make the fur coverings for the tents, the travellers were compelled to remain from the 15th to the 18th May in a tent but half covered, exposed to a cold of 18° below the freezing point of Reaumur, or -8.5° Fahr.

On the 28th of May, with much difficulty, they reached the Lagota, an affluent of the Taïmyr, on whose bank they arrived on the 2nd of June, and here the individual who had promised them assistance abandoned them. The boat was now completed by means of the planks which formed the bottoms of the sledges. The summer had set in, the river rose, and by the 23rd of June it was free from ice, and the boat being ready was launched on a bright midnight sunshine, under the 74th parallel of N. latitude; and on the 4th of July the party embarked, leaving a man on the spot to attend to the fishing.

From this time commences a series of disappointments and disasters such as few travellers have had to encounter, accompanied by a failure of provisions. In vain they cast their nets for fish. In vain Mr. Mid-

dendorff had recourse to his gun, in a clime where no birds were seen. They now discovered a cavern, which, on the supposition that it was the same mentioned by a previous traveller, "Laptieff," led them to believe that they were only 52 versts from the sea. This inspired fresh courage, and they proceeded northward. On the 4th of August the last biscuit was shared out, and nothing was now to be their fare but a little raw fish. On the night of the 7th the freezing of the pools announced the approach of winter. The coast was not yet reached, and what would not be their difficulties on the return? Perhaps, hemmed in by the ice, far from any succour, they would perish in these dreary regions. Still Mr. Middendorff boldly pushed on. At last on the 12th the coast was reached, and, animated by this success, the intrepid traveller prepared to put to sea, in order to gain a promontory seen stretching away to the east; but adverse winds forced him to put back. The return southward was still more disastrous than had been the journey northward. Time will not allow me to enter into all the details of this hazardous journey; suffice it to say, that, in returning through the Lake Taïmyr, the expedition was caught by the ice, and the boat was run ashore. With the wreck of the boat they constructed a sledge, but had hardly proceeded with it for three versts over the rocks when it fell to pieces. On the 30th of August Mr. Middendorff, worn out with fatigue and anxiety, was taken so seriously ill as to be unable to proceed. Pressed by hunger they were compelled to kill their faithful hunting dog that had been so useful to the expedition. Even the blood of this animal was not disdained, his flesh was divided into five portions, and, thus provided, Mr. Middendorff ordered his four companions to go in search of the Samoyedes in the desert, and, if possible, bring him relief.

Alone and ill, without shelter at the approach of an arctic winter, under the 75th parallel of latitude, Mr. Middendorff remained in this state for eighteen days, during the last three of which the storm covered him with snow, and thus saved his life. At one moment, believing that his companions must have perished, he was horror-struck with the reflection that his own dreadful situation might deprive him of reason. Self-preservation, however, roused him, and, with a little melted snow, mixed with spirit of wine, in which an object of natural history was preserved, as a beverage, and a partridge which he accidentally caught, he was somewhat restored. He then made a little sledge to drag after him, and, converting a portion of his pelisse into boots, he started, and soon after was happily found by one of his party, coming for him with two Samoyedes. On the 8th of October Mr.

Middendorf was again with Mr. Branth and his party on the banks of the Boganida. The sufferings bravely borne by Mr. Middendorf have few parallels in the annals of travelling, and his conduct, therefore, justly entitles him to that admiration which every man must feel for the rare qualities he has proved himself to possess.

The Ural Mountains.—Gold Produce of Siberia.—From the ice-bound country of the Samoyedes let us now turn to the Ural Mountains which separate Europe from Asia, and the rich metalliferous tracts of Siberia.

In his recent work on Central Asia our associate the Baron von Humboldt has placed these mountains before you in a clear light, describing them as composing a meridian chain, which, in common with other ridges having a north and south direction, possesses striking auriferous and other mineral characters. In order to develop my own views of the ancient sedimentary rocks of which the Ural is, to a great extent, composed, and to show how they differ from the accumulations upon their flanks, it was desirable to possess, at all events, a good map of that portion of the mountains which has been colonized by the Russians, and I have, therefore, with the consent of the Council, constructed a map through the aid of Mr. Arrowsmith, which will appear in the second part of the thirteenth volume of your Transactions. This map is chiefly based on that generally known as Humboldt's Berlin map, which was grounded on the observations of Wischnewsky, Schubert, Humboldt, Adolph Erman, and some local maps. But though the Russians have not yet published a complete map of the Ural Mountains, and have not even triangulated the area, parts of this tract have been laid down with much greater accuracy than others. Thus all the Southern Ural, as included in the government of Orenburg, was, by order of General Perovski, formerly governor-general of that province, carefully sketched by the staff officers under General Rakasofski; a reduced copy of this document, presented to me by General Perovski, and others collected from the Russian officers at the different mining establishments, will form the groundwork of my map. It will apply, however, only to the colonized and mining part of the chain, and the countries through nine degrees of latitude, and it is specially to be viewed as developing the great expansion of the Southern Ural from $51\frac{1}{2}^{\circ}$ to $55\frac{1}{2}^{\circ}$ N. lat., which Baron Humboldt has termed the trifurcation of the chain. In this region the ridges expand in a fan shape, but in the central tract (the northernmost of the Russian miners) one dominant ridge only, with low parallel counterforts, is traceable from $55\frac{1}{2}^{\circ}$ to $61\frac{1}{4}^{\circ}$ N. lat. The true northernmost Ural, extending from $61\frac{1}{2}^{\circ}$ to the

Northern Sea, slightly peopled by wild Voguls, Ostiaks, and Samoyedes, and covered with marshes and dense primæval forests, has never been occupied by the Russians, and is necessarily very imperfectly known to geographers. On its eastern flank, indeed, the Imperial School of Mines have, in late years, pushed forward with great difficulty a *reconnaissance* under Captain Strajefski, from the most northern settlements to 65° , where the central chain, or Ural of the natives, was found to be still persistent in its lithological characters and prevailing altitude, the watershed exceeding 2000 feet above the sea, with occasional peaks or groups of much greater height. In the Southern Ural, these summits, as determined by Colonel Helmersen and M. Hoffman, range from 3114 and 3498 feet, in the Irendik and Tagansai, to 5071, in the Iremel. In the central portion the chain is much depressed, and the high road to Siberia traverses it at the lowest point. In following it to the north, high peaks again appear in the Katch Kanar 2942, and afterwards in the Konjukofski Kamen, 4796 to 5116 feet. From these, in a general sense, or as a great meridian chain, Humboldt has correctly defined them as ranging far to the south of Orenburg, and as terminating only in the high grounds which separate the Aral and the Caspian Sea, and on the north as reaching the Isle of Vaigatz and the mountains of Obdorsk. Up to this moment, however, it has been a question where the central ridge really terminated upon the north, and whether or not it offered any great lateral ramifications upon the west.

Though no travellers have yet continuously explored these tracts of the chain which lie between 65° N. lat. and the Northern Sea, there is little doubt, from what has been detected in the Isle of Vaigatz, where Silurian and other palæozoic fossils have been found, that the geological system of the Ural is continuous to that point. We know, indeed, from the exploration of Captain Strajefski already alluded to, that the axis of the chain, at least its eastern flank to 65° N. lat., is composed of rocks essentially similar to those of the Ural of the Russian miners, and from that point to the Northern Ocean it is very unlikely, that a chain so persistent in character throughout its course should present any essential differences. In fact, the recent explorations of Count Keyserling, to $66\frac{1}{4}^{\circ}$ N. lat., have shown that the western flanks of the chain (near the sources of the river Ussa) are composed of the same palæozoic rocks which occur in the colonized and mining districts. Again, from the prevalence of orthoceratites, producti, and other fossils, as well as carboniferous matter in their rocks, the philosophic naturalist, Baer, had suggested that the large and lofty islands of Nova Zemlia, stretching out far northward into the Arctic Ocean, are, in their structure, also a

prolongation of the Ural and its dependencies; indeed, a reference to a general map of Northern Asia might lead any one to believe that Nova Zemlia is, in fact, a continuation of the chief or central mass of these mountains.

Recent discoveries have, indeed, induced me to consider this north and south mass as the central member only of *three great bands*, into which the Ural of these northern latitudes unfolds. The eastern limb, radiating to the N.N.E. from 65° N. lat., passes into the Obdorsk Mountains and the great promontory which separates the Gulf of Obc from that of Kara. First explored by Sujeff, under the direction of Pallas, the correct geographical position and altitude of these mountains were only determined by the enterprising and indefatigable geographer Adolph Erman, who fixed their direction to be 35° E. of N., and their loftiest summit to be near 5000 English feet high. Lowering gradually, as it trends to the S.W., this Obdorsk ridge unites with the Ural in 65°.

I am now disposed to consider another line of elevation upon the N.W., as a third range of the Northern Ural. This western prong of the great northern trifurcation is one which has been made known by the labours of Count Keyserling, during the last summer, and will be fully described in the work alluded to (p. 9). It separates from the main Ural, or middle chain, in lat. 62°, trends in a north-north-westerly direction for the space of upwards of 500 English miles, and, exposing a full succession of all the Uralian rocks on the east side of the Gulf of Tcheskai, finally disappears in the rocky headland of Kanin-nos. This last-mentioned low range, the chief part of which is called the Timans, and which is separated from the Ural by a vast trough of Jurassic deposits, traverses in its northern part a region occupied by Samoyedes, and extends beyond the limits of the forests. It was, indeed, wholly unknown to geologists, and only known to geographers through old works of the sixteenth century,* till the close of the last summer, when its explorers, Count Keyserling, and his able associate, Lieutenant Krusenstern, son of our valued foreign member, returned to St. Petersburg. Their astronomical observations have corrected the latitude and longitude of many places, and determined the correct course of the Petchora and all its tributaries. The survey of Count Keyserling has further taught us that, forming the western flank of the great valley of Petchora, or north-eastern limit of the great Permian basin, the Timans ridge is so identical with large portions of the Ural that it cannot be dissociated from that chain; whilst from its component

* The Map of this region, engraved upon wood at Nuremberg by Hiravogel, in 1547, is considered the most ancient map in Russia. See Humboldt, '*Asie Centrale*,' vol. i., p. 456.

parts being less metamorphosed than those of the Ural, and also from containing many organic remains, their development throws great light on the true structure of the Ural, anterior to its invasion by eruptive rocks, and also upon the whole series of the palæozoic deposits of Russia.

Such, therefore, is this long meridian chain, which, followed from the high grounds between the Aral and the Caspian to the northern extremity of Nova Zemlia, traverses not less than 592 marine leagues, and which, having a simple or mural character in the central portion of its course, is strikingly marked by fan-shaped embranchments, both upon its northern and southern extremities.*

I have sincere pleasure in thus publicly alluding to the researches in the basin of the Petchora, which have laid open to geographers a part of the continent of Europe hitherto hidden in obscurity. These researches originated in the ardent desire of my friend and colleague Count Keyserling to wipe out the stigma which attached to modern geographers, of having left so vast a region as great a blank upon our maps as the interior of Abyssinia. To the geological portion of the discoveries of my friends and self I will not now advert, simply saying, that as our volumes will soon be placed in your library, you will have full opportunity of studying them; but I beg you to observe, that without a perfect previous acquaintance with the structure of the Ural, it would have been impossible to say that this Timans ridge was what I have pronounced it to be—nothing but a great north-western embranchment of the Ural, which, having a length of 500 miles, is essentially comprised of Silurian, Devonian, and carboniferous deposits, with a few rocks of eruptive character and igneous origin, which in parts have changed the above-mentioned strata into the condition of crystalline or metamorphic rocks. In the Timans, therefore, as on the western flank of the Ural, the palæozoic strata are comparatively little disturbed, crystallized, or mineralized. It is in the centre, and specially in the eastern flank of the Ural, where igneous agency has been so rife, and where the original deposits are only to be detected in shreds and patches, that the great metalliferous accumulations abound, which have rendered this chain so rich and so famous.

Gold Produce of Siberia.—To this subject I wish to point the attention of statistes and geographers, for it has already begun to occupy the thoughts of politicians, and may eventually have a very marked influence upon all civilized nations, in changing the relative value of gold as a standard.

* Ordinary travellers, who simply cross the Ural by the high road to Ekaterinburg, where the watershed is at its lowest level, can have but a very imperfect notion of it, and can only compare it in altitude to the Vosges between Metz and the Rhine.

In Russia, as in the Brazils, the great mass of the metals is derived from local detritus or alluvia, usually called gold sand, but for which (as far as Russia is concerned) the term of shingle would be much more appropriate. With very trifling exceptions, all such auriferous detritus in the Russian empire occur on the eastern or Siberian side of the Ural. Slightly known, and near Ekaterinburg only, in the days of Pallas, it was only in the reigns of Paul and Alexander, that these gold alluvia were found to extend in a certain zone to the N. and S. of that locality, throughout 5° or 6° of latitude, and that eventually gold was extracted from them to the annual value of about half a million sterling. Notwithstanding the increased exploration of late years, and many researches in the northern and southern portion of the chain, this quantity has been rarely exceeded, and latterly, the alluvia in some tracts being exhausted, it has begun to decrease. The reign of the Emperor Nicholas has, however, been distinguished by the important discovery, that portions of the great *eastern* regions of Siberia are highly auriferous, viz., in the governments of Tomsk and Ieniseik, where low ridges, similarly constructed to those on the eastern flank of the Ural, and like them trending from N. to S., appear as offsets from the great E. and W. chain of the Altai which separates Siberia from China. And here it is curious to remark, that a very few years ago this distant region did not afford a third part of the gold which the Ural produced, but by recent researches, an augmentation so rapid and extraordinary has taken place, that in the last year the eastern Siberian tracts yielded considerably upwards of two millions and a quarter sterling, raising the total gold produce of the Russian empire to *near three millions sterling!!*

Now if this great increment be sustained during a certain number of years, there can be no doubt, that it will, to some considerable extent, reduce the standard of value, and lead to considerable change in our social relations. The first question therefore is, to what extent is it likely to be sustained? Gold alluvia being but the detritus of veins which once existed in the adjacent rocks, it might be supposed, that in piercing these rocks the miner would find more copious stores of the metal. Experience, however, has taught us, that such is not the fact, and to whatever cause due, it is certain that the veins which rise from great depths in the crust of the earth, are richly auriferous towards their *upper limit only*. Hence it is, that nearly the whole of the ancient surface of rocks having undergone denudation and consequent destruction, the greater quantities of gold are found in the detritus on the flanks of the hills, or in the valleys between them. So long, therefore, as these alluvia are unexhausted, so long may the miner extract from them,

by a cheap and easy method of macerating and washing, the ore which would be obtained at much greater cost from the solid rock. Now, those alluvia having well-defined bottoms, and being of measurable extent, may certainly be exhausted; and the disappearance of gold from all those civilized countries, in whose early days it was abundantly found (even in our own isles), is a proof that such must sooner or later be the case. But how long is it before this period of exhaustion will arrive? When we reflect upon the length of time which the one region of Brazil has continued, I believe with undiminished quantity, to supply modern Europe with its great mass of gold, the opening out of a new El Dorado should teach us to be very cautious in attempting to limit the auriferous capacity of the vast and slightly explored regions of Siberia. The N. and S. counterforts of the great Altai may, in truth, prove to be but the indications of similar spurs, or detached meridian ridges, which may be discovered in many other tracts of a region equal in extent to the whole of Europe. From the researches of the Russian engineers, and from Humboldt and his associates, we learn, that rocks similar to those which are so auriferous in the Ural, reappear in various parallels of longitude along the flanks of the Altai. By a recent letter, indeed, from my friend Colonel Helmersen, the distinguished and successful explorer of the Ural, Altai and Siberia, I learn that his former associate in these countries, Professor Hoffman, has, in his last visit of 1843, discovered a tract in Siberia, in which the very richest gold alluvia occur in a "terrain" exclusively composed of granite and metamorphic schists, the gold being in the latter. Now in the Ural, as in other parts of Siberia, greenstones, syenites, and serpentines seem invariably to have been the agents by which the metamorphic rocks have been rendered auriferous; this discovery, therefore, widens the field of the gold-searchers, and opens out great probable, practical as well as theoretical, results. In truth, Siberia and its adjacent regions may be found to contain another Brazil, where granite also is the great eruptive agent of mineralization and metamorphism.

Count Keyserling also assures me in one of his letters that the discovery of M. Hoffman *relates to an area larger than France*, every part of which seems to be more or less auriferous, and *all the subjacent rocks* (Silurian schists and limestones?) when pounded up and analyzed affording a certain per centage of gold! If this diffusion of gold, through the very matrix of rocks, which is, I may observe, a phenomenon hitherto almost unknown,* be really found to hold good over so vast an area, it

* In my travels in the Ural I learned, indeed, from General Anosoff at Zlatoust, that by a searching analysis, gold had been discovered disseminated in the matrix of some of the limestones south of Miask.

imparts a new and most important element to our reasoning, and renders it vastly more probable, that no sort of limit can be set to the increase of the produce of Russian gold. We know also from our enterprising medalist, Adolph Erman, that palæozoic, eruptive, and metamorphic rocks, similar to those of the Altai and the Ural, extend even to the Alden mountains, not far from the shores opposite Kamtschatka; and if so, why may they not contain the same minerals? Again, we are told by Helmersen and others, that some of the southern offsets from the Altai, which extend into China, are auriferous, and one of them, the Tar-Bagatai, the northern part of which is in the Russian territory, has already proved highly productive. The last fact is of very great importance; for the Celestial empire, which has only just now been partially opened out to European enterprise, may very probably (and I have strong reasons to think that the same classes of rocks extend through Chinese Tartary) prove to be another golden region like Siberia. Even in our own Hindostan, auriferous veins and deposits, as yet, it is true, of no great value, are known at various points from N. to S., and have recently met with a good describer in Lt. Newbold, who strongly urges their further and more scientific exploration;* whilst we have yet to learn, whether, in the progress of civilization, the gold tracts of South Carolina may not afford considerable additions to the metallic wealth of the new world.

But, reverting to Northern Asia, how are we to limit our anticipations of the augmentation of such produce, when it is a fact, that within the last few years only, a tenth portion of the earth's surface (Chinese Tartary and Siberia) has been, for the first time, made known to us as in many parts *auriferous*, and when from one portion of it only, Europe is already supplied with so very large an amount of her chief circulating medium? Well may political economists and politicians now beg for knowledge at the hands of the physical geographer and geologist, and learn from them the secret on which the public faith of empires may depend. Well may even our own government, so deeply interested as it is in this great question, as regards China, stimulate, encourage, and reward our geographical researches, and enable us to reach those tracts belonging to our great ally, who, in a few years, may not only have tea and other natural products, but abundance of gold and other precious metals to exchange for our manufactures.

* These, gentlemen, are new and striking features in the polity of nations, and where is the public man who will now deny that some

schooling from ourselves, and our colleagues and brothers the geologists, will not enable him to grapple more effectually with questions so deeply important to posterity?

Caspian Sea.—In a former year, the labours of the Russian professor, Eichwald, on the geography of the Caspian, were spoken of by Mr. Hamilton, more particularly in relation to its ante-historical or ancient condition, and I have now to direct your attention to a valuable recent work of the same author upon the existing "Fauna" of that sea.

Humboldt has indeed brought before the public the whole subject of the Caspian, and the depression of the earth's surface, of which it forms a part, both in his "*Fragmens Asiatiques*," and in his "*Asie Centrale*." In the first of these works it was assumed, according to the barometrical observations of M. Parrott, that the level of the Caspian Sea was 300 feet below that of the Black Sea and the Sea of Azof. The trigonometrical levellings of Messrs. Fuss, Sawitsch, and Sabler, since undertaken by the Imperial government, and most accurately calculated under that profound astronomer M. Struve, have shown that the depression was very considerably overrated, and they have finally reduced it to 83·6 English feet.*

The last year has brought another champion into this field of difficult research, in the person of M. Hommaire de Hell, a French engineer, who endeavours to reduce the level to little more than 60 English feet. This gentleman had the advantage of being accompanied by his very accomplished lady, who, whilst her husband was engaged in the laborious duties of his survey, made sketches of the steppes and their Calmuck occupants, and has graphically and elegantly described the manners of the people, in a splendid work now issuing from the press, entitled, "*Les Steppes de la Mer Caspienne*." A map of the whole of the South of Russia, by M. de Hommaire, not yet published, will accompany the work.

But to return to our subject of the level of the Caspian. The measurements of M. Hommaire, from the Sea of Azof to the Caspian, were made by very numerous levellings which passed continuously through the lower country, in which he profited by the evidences afforded along the course of the rivers Kuma and Manitch, for an account of which I refer you to his explanations given in the bulletin of the Geological Society of

* Until the winter of this year the calculations were not completed; but as M. Struve has obligingly communicated the results to me, the proofs, upon which the level of 83·6 English feet depends, will be published in our '*Transactions*.'

France.* Yet although M. Hommaire is an engineer of great merit, and though the Geographical Society of France has awarded the half of its first prize to him, for his travels and levellings, undertaken amid many privations, and in a trying climate, I cannot assent to a belief in the greater accuracy of his results, than those of the Russian mathematicians above alluded to. The erroneous results in the barometrical estimate of M. Parrott were accounted for by the multiplication of small errors in calculating from station to station; and he himself suggested the method by which the whole question should be finally set at rest: hence took place the consecutive series of levellings from the Sea of Azof, by Stavropol and Georgiefsk, to the Caspian. Few means, indeed, could have been better devised than *the four independent measurements* employed by the able mathematicians Fuss, Sabler, and Sawitsch; and as their results, which agreed very closely, are thoroughly relied upon by M. Struve, and have been adopted by so great an authority as Humboldt, most geographers will, I apprehend, adhere to them.

But even if the Caspian be ultimately shown to be a few feet less depressed, it is now generally admitted that it is considerably lower than the Mediterranean: and then arises the question what has led to this difference of level? In attempting to solve this problem, as well as others of the same kind (of which the Dead Sea is by far the most notable example), the geographer must, I apprehend, consult the geologist. The first point to ascertain, then, is, what was the extent of the Caspian in its most ancient state; and what traces has that sea left of the area which it occupied? Before the fact of the depression was known, and seeing that the Caspian, Aral, and Black Seas were only separated by low steppes, often saline, and here and there covered with shells of animals similar to those now living in the Caspian, Pallas imagined, that in the earliest historical times the three seas must have been united in one mass of water, which also covered the wide steppes N. of Astrakhan and large tracts to the N.E. The western barrier, which was supposed to have held up this vast mass of water, was imagined to have been broken through by a great convulsion, which formed the Straits of the Bosphorus, through which the superabundant waters having been poured off, large low tracts were drained, and the inland seas reduced to their present separate limits. This view, which is more or less adopted by other writers, was subsequently developed at great length by General Andréossi, who, in his work upon the Bosphorus, took great pains to establish the fact that this disruption gave rise to one of the local deluges of Greece.

* Anno 1843, p. 263, 269, 322, and 365.

Believing, with these authors, in the former higher level of the Caspian, and its escape by the same channel, M. Hommaire conceives it to be more natural to suppose that the present depression of this sea is due to a diminution in the supply of the water furnished by its great feeders the Volga and the Ural, than to a sinking of its bed. To this point, which is however a mere nothing in the general question, I will presently revert.

In our endeavours to solve this curious problem, let me first observe that we must carefully separate the ancient geographical, or rather geological, conditions from modern geographical changes; or the records of primeval nature from those which are truly historical. What then are the facts? Are we to infer the former wide diffusion of the Caspian from the existence of salt steppes alone? Certainly not; for in some of these with which I am personally acquainted, as in that N. of Astrakhan (the greater part being below the level of the ocean), it is well known that the salt rises in springs from subjacent strata of high antiquity—strata formed before the accumulation even of the secondary rocks.*

Other saline deposits in these steppes may, indeed, have been accumulated in subsequent tertiary periods; but as rock-salt and brine-springs, to whatever cause originally due (and igneous action upon marine residue may be called for to explain their formation), exist in all parts of the world, and in strata of very different age, it is obviously impossible to look to the presence of intensely saline deposits as a satisfactory explanation of the former extension of the Caspian Sea, which is only of a brackish nature. But the fauna of that sea, as we learn from Eichwald, is very peculiar; and, comparing things aquatic with things terrestrial, we may fairly say that the creatures which inhabit the Caspian are as unlike those which live in the Mediterranean and the ocean, as those which now exist in New Holland differ from those of other continents. Its brackish waters, which even now are drunk by the savage Turkoman, along a portion of its eastern coasts, where no fresh springs occur, have alone afforded to the researches of the naturalist the small number and variety of about thirty species of shells, with fishes for the most part having fresh-water forms; whilst hundreds of species prevail in the Mediterranean and the ocean. Now these shells, differing entirely from those of the ocean, are all of species which are found in brackish water, and many of them are common to pure freshwater lakes and rivers.

* This point is explained in 'Russia and Europe, and the Ural Mountains,' now in the press, vol. i.

Among these, certain Mytili and Cardiacæ, some of which ascend far up the Volga and the Don, with a few univalves, most of which* are eminently of lacustrine and fluviatile characters, constitute the striking features of the Caspian Fauna.* Of these several species are found, not only strewed about upon the sandy surface of the lower and desiccated steppes, but also impacted in solid limestones, which at one period must have formed their shores. Now some of these limestones, so loaded with certain species peculiar to the Caspian, rise to heights of 200 and 300 feet above the Sea of Azof, of the Black Sea, and the Caucasian steppes; and in the great and elevated plateau of the Ust-Urt, which separates the Caspian from the Aral, they attain the elevation of upwards of 700 feet above those waters, and are spread far and wide over the desolate tracts extending towards Khivah.† Are we then to infer that such shells, entirely distinct from any oceanic forms—undoubted remains, as they are, of a former Caspian—indicate by their present position the real level at which that inland sea once stood? Such has been the hasty conclusion even of intelligent travellers; but if the summit of the Ust-Urt really represented the undisturbed bed of the Caspian, that sea must have stood at 800 or 1000 feet above its present level; and, if so, it must have submerged all north-western Europe, with the exception of the mountain chains! That such, however, has never been the case is too evident; for neither the tracts to the W. of the Black Sea, nor any of the adjacent low countries to the N. or S. of it, present traces of Caspian deposits. The truth then seems to be, that in the later part of the period which geologists call tertiary, there existed an inland Mediterranean, of brackish water, probably of greater extent than the present Mediterranean, which was entirely shut out from the adjacent seas by slight inequalities of land, since removed by certain oscillations of the surface. This condition of things was next disturbed by other vibrations, by one of which a large part of the ancient bed of this great inland sea was thrown up into the plateau of the Ust-Urt, and thus was the Aral separated from the Caspian; for all the tract between them, lofty as it is, was once the bed of an united and continuous sea—as proved by the equable distribution of the *same* peculiar organic remains.

After this separation from the Aral, the Caspian remained connected

* I may here give a familiar example of the hardy and persistent nature of one of the most common of the mollusks, now living in the Caspian, the *Mytilus polymorphus* (Linn.). This shell was formerly supposed to be peculiar to the Caspian and Black Seas, and the tributary rivers, in which it was known to ascend for many miles above their mouths, when by accident some living specimens were found in our London Docks, to which they had been transported in the timbers of Russian vessels: from that locality they have since extended themselves into the interior of England by the Croydon and other canals.

† See Abbott's Journey.

with the Sea of Azof and the Black Sea, and probably spread over all the lower steppes of Astrakhan and the countries between Asterabad and the Oxus. Another period of elevation occurred, which, in desiccating these lower steppes, left the Caspian of the present day, as the small residue of the once mighty Aralo-Caspian Sea.

That such grand mutations must have been carried on, there can exist no doubt; for, independent of the fact that beds of limestone, marl, mud, and sand, containing the same peculiar shells, now lie *at such very different levels*, we have in the adjacent chain of the Caucasus the most distinct proofs of great outbursts of eruptive and volcanic matter, within the very period to which I refer; and the extravasation of such matter, and the upheaval from below of great masses, formerly submarine, must necessarily have been accompanied by correspondent depressions. Hence the Aral, Caspian, and Black Seas (all of which we can rigidly demonstrate, by peculiar organic remains around them, to have been formerly one sea), have been separated and left at different levels. Other similar phenomena in Europe are to be explained upon the same principle.

Around the shores of our own islands, as well as on the coast of Norway and Sweden, beds of sea-shells, of existing species, lie at various levels, from 50 to 600 feet, above the present ocean; and these are now confidently referred, not to depression of the ocean from different levels, but to successive elevations of the land.

In the application of this reasoning to the chief outlines of the territories of the Caspian and the Aral, I hope in a very short time to publish, with the assistance of my colleagues, some satisfactory explanations, which I would beg you to consult before the next anniversary; trusting that you will find in them a valid support of my opinions, and a proof that, without duly interrogating nature after the manner of geologists, it is idle for the geographer to attempt to connect traditional history with appearances upon the surface. It is only in the hands of such antiquaries as Humboldt—men fully alive to the weight of geological evidence—that the changes which have really taken place within the *historic era* can be rationally evolved. One thing we can safely assert, that such historical changes are as zero compared to the grand revolutions to which I have adverted. This remark brings me naturally back to the point in the statement of M. Hommaire, that the Volga and the Ural rivers are now contributing much less water to the Caspian than they did in the earlier historical period. Of this I have no doubt; for, by the destruction of her great forests, the diminution of her marshes, and the progress of culture, it is quite evident, that the volume of water carried down by the fluvial systems

of Russia must be infinitely smaller than in former times. If, then, the present loss of water by evaporation be assumed to be neither more nor less now than formerly, it follows that the Caspian must be gradually subsiding. The standards fixed upon the rocks near Derbend, at the suggestion of Humboldt, will go towards deciding this question; but as that locality is upon or near a line where the surface is penetrated by gases and mud volcanoes, and may therefore be presumed to be somewhat unstable; the opposite shore of the sea, Cape Tük Karagan, for example, or the Russian fortress of Novo-Alexandropsk, which are far removed from all such disturbing agency, might be more satisfactorily appealed to. The pestilent climate, however, of the region, and the uncivilized condition of its inhabitants, render it very difficult of access to men of science; and many years may elapse before we are provided with more accurate data than have already been furnished by Humboldt, Eichwald, Göbel, Felkner, and Hommaire.

There is still another subject connected with the Caspian, concerning which there exist differences of opinion. From the evidences alluded to, as well as from the nature of its inhabitants, I have been led to infer that, *on the whole*, the Caspian is less saline than the ocean; but M. Hommaire contends that it contains more salt, and thereby fortifies his theory of the gradual diminution of this sea by evaporation only. Having already shown that such diminution cannot be accounted for without an appeal to other and very different causes, I must leave this question of the less or greater quantity of salt to be decided by an accurate analysis of the water taken from different parts of the sea; in some of which, at great distances from the mouths of the Volga and Ural, an excellent chemist, Göbel, has shown that there is less salt than in the ocean. After all, I beg to ask if the portions of the sea which are highly saliferous may not derive their properties from springs, proceeding from masses of rock-salt, like those of the adjacent steppes, which, as before explained, are wholly independent of the present or former Caspian.

Baltic Sea, diminution in the height of its Waters.—From the south-eastern limits of Russia let us turn for a moment to the north-western. Major L. Beamish, F.R.S., read a paper at the last meeting of the British Association on this interesting subject, and from that gentleman's account it appears that, since the year 1841, the level has continued to sink along the Swedish coast. As the level of the North Sea does not alter, the apparent depression of the waters of the Baltic can be attributed only to an elevation of the land, which indeed has been proved to take place by the observations of Von Buch, Lyell,

and many others. The fall of the water, or rather the elevation of the land, is said to take place fitfully, and to be different in different parts of the coast. It is probable, however, that in some exceptional cases these so-called paroxysmal elevations and depressions may have been due to other causes than the rise of the land; thus the seasons effect a difference in the level of the Baltic, as in all other tideless seas, which receive in the spring a great accumulation of water from the melted snows of the basins which send their waters to it. The prevailing winds also change the level along the coasts; and, lastly, as has been shown by Schulten in the '*Mémoires de l'Académie des Sciences de Stockholm*' for 1804, the irregular rise and fall of the Baltic may be explained upon the same principle as the phenomenon of the *seiches* of the Lake of Geneva, described by De Saussure, viz., by the unequal pressure of the atmospheric column, as shown by the barometer at the times of the oscillations.

DENMARK.—In this kingdom some very important labours in geography and its cognate sciences are going on. In the year 1843, the Government published the 7th part of the Statistical Tables of the country. In the same year the Royal Society of Rural Economy published the 16th, 17th, and 18th parts of the Description of the Danish *Amts*, or shires, principally with reference to agriculture, viz., Odense Amt, by Mr. Hofman Bang; Skanderborg Amt, by Mr. Schytte; and Holbek Amt, by Mr. Hasle. Bergsøe's Statistics has been continued by the publication of the 2nd and 3rd Numbers.

The Meteorological Committee of the Society of Sciences has received meteorological observations not only from several places in Denmark Proper, but also from Reikiavik in Iceland, Godthaab in Greenland, and Christiansborg in Guinea.

Professor Schouw has given a view of the geographical and historical relations of the Italian heaths and vacciniums; and Mr. Folbe has communicated to the Society of Sciences an account of his works on the northern coast of Africa, with reference to ethnography, topography, and archæology.

In the year 1843 the hydrographic survey of all the Danish coasts and seas was completed; and before the end of the year the Hydrographic Office published '*The Danish Pilot*,' a complete nautical direction for all those parts of the coast of Denmark, and the adjacent coasts of Sweden and Germany. The Hydrographic Office also published a chart of the *Sleeve*, engraved on steel, and another of the S. entrance of the Sound, with part of the Baltic. A chart, completing the '*Danish Hydrographic Atlas*,' is in the hands of the engraver.

My friend Professor Forchhammer, the author of the excellent geological map of Denmark, has discovered a large bed of upper green sand near the little town of Kløge—a discovery which explains both the formation of the deep bay of Kløge, between the flinty chalk of Steen's Klint, and the hard limestone of the vicinity of Copenhagen, and the existence of a great number of very rich springs at those places, which we now know to be the boundary of the green sand-bed.

The Society of Northern Antiquaries continue their important and highly interesting labours with unabated vigour; and they are hailed with much satisfaction by the geographer. In pursuing their honourable task of illustrating the antiquities of Northern Europe, they have lately published the historical monuments of Iceland and of Scandinavia. The following also have been amongst their most recent contributions in this department of science:—

Danish Books.—The first volume of the 'Historical Monuments of Iceland' (*Íslendinga Sögur*); or the original writings from whence are taken the history of Northern Europe and America, and particularly that of Iceland, from the ninth to the fourteenth century. This volume, edited by John Sigurdsson and Charles C. Rafn, with an introductory examination by Finn Magnussen (the former one of our corresponding and the latter one of our honorary members), is almost exclusively geographical. It comprises two works by the oldest of Icelandic historians, a clergyman of the name of Áre Thorgilsson, surnamed *Fróde*, or the Learned (born in 1068, died in 1148), viz. 'Íslendinga Bok, or Schedæ de Islandiæ;' and '*Landnamabók*, or Liber originum Islandiæ,' to which the first named work is to be considered as a prodromus. Here the first voyages of discovery are mentioned as undertaken partly from Denmark, partly from the Faroe Islands and Norway, as well as the emigration of the Northmen to Iceland, and several other countries, occasioned principally by the wars of conquest of Harold Harfagre against the petty kings of Norway, which ended in the subjugation of the whole of that country. Iceland was discovered, according to the latest investigations, in the middle of the ninth century, by Gardar, a Dane of Swedish extraction, who lived in Sealand; and the first settlement of the country was commenced in the year 874, by a Norwegian named Ingolf, who established himself at Reykiavik, and it is stated that the country was completely settled during a period of sixty years. In the above-mentioned work an account is given of the settlement of Iceland by the colonists (*Landnama-menn*), together with their genealogies; and an exact statement of that particular district which each of them took possession of, and which they again partly distributed, in

different ways, to their fellow-travellers or inferiors. There is scarcely any country that can produce such a work respecting its first settlement as the 'Landnamabók.' The colonies established by the later Europeans in other parts of the world, particularly in America and Australia, and which have since become so powerful and important, may probably undertake similar works, in which case the one just mentioned may, in certain respects, be recommended as a model. The volume is illustrated with four plates, with fac-similes of the MSS. or parchment that have been used, by a map of ancient Iceland in the year 1000, by registers, and by a complete geographical index.

The third volume of the 'Historical Monuments of Greenland' (*Grönlands Historiske Mindesmærker*), containing extracts of the annals, together with diplomas respecting Greenland—a complete collection of geographical accounts, from the middle ages, relating to Greenland, treated in a similar manner to the first two volumes of Finn Magnussen and Charles C. Rafn. In the present work are contained instructions for the course to be taken by vessels going to the polar land, extracts from ancient Geographies respecting Greenland, descriptions of the country, &c., and a contribution to the knowledge of the physical qualities, products, and curiosities of the country; a description of the summer abodes of the Greenlanders in the arctic regions of America; contributions to an illustration of the jurisprudence of the ancient Greenlanders; an account of voyages and travels from 1385, by Björn Einarsson and others. There are, moreover, the voyages of the brothers Zeno, with an introduction and explanatory remarks by the late James H. Bredsdorff; and two articles by Dr. Pingel, who has lived and travelled for a long time in Greenland, viz. a view of the most important voyages that have been undertaken in modern times from Denmark and Norway, in order to re-discover Greenland, which had been lost sight of for many generations, and again to fix establishments there; an antiquarian chorography, partly founded upon the accounts of the voyages and antiquarian researches that have been undertaken in the largest fiords of Greenland, under the direction and at the expense of the Society of Northern Antiquaries. Next follow a view of the ancient geography of the country, founded upon ancient chronicles, and illustrations of the ancient buildings of the country, from the period of its first settlement. As a more complete illustration of the whole subject, and for the greater facility of research, there are affixed a list of the bishops; a chronological, historical, geographical, and antiquarian index; twelve plates; besides two maps of the travels of the brothers Zeno; delineations of Greenlandish seals; ground-plans of the ruins at Ikigit,

Tessermint, Igalikko, and Kakortok; a view of the ruins of the church at the last-named fiord; delineations of the inscriptions in Runes and Latin letters, which have been found in Greenland; and two maps, which I shall presently mention.

A new and enlarged edition, in French, of Charles C. Rafn's 'Memoir on the Discovery of America by the Scandinavians, in the tenth century,' illustrated with nine engravings on steel, partly founded upon the same author's work, 'Antiquitates Americane,' published by the Society in the year 1837, and partly upon the elucidations which have been effected by a committee of the Society for the Ante-Columbian History of America.

'The Annals of Northern Archaeology:' the volume for 1842 and 1843, with ten plates. In the year 1842 the Society established a committee for investigating the ancient relations of the Scandinavians with Asia. One of the objects to which the Society has begun to direct its attention is the number of oriental coins which are frequently found in Scandinavia, particularly in Denmark and Sweden, and even some single ones in Iceland, whereby the voyages and commercial intercourse of the northern nations in past times acquire a very important elucidation. The greatest part of this volume consists of four treatises, by the Rev. James C. Lindberg, A.M., on considerable discoveries of this sort of coin from the eleventh century, and partly of Anglo-Saxon and other occidental coins from the same period.

The Society's Memoirs ('Mémoires des Antiquaires du Nord'), the volume for 1840-1843. Nicolaas L. Westergaard, a member of the Society's Asiatic section, after having published a work entitled *Radices Lingua Sanscritæ*, with a linguistic object, set out on a voyage to India and Persia, where he has already made acquisitions for the enrichment of science. To this volume he has contributed the first section of a grammatical view of the connexion between Sanscrit and Icelandic. Of the rest of the contents of this volume I may mention an account, by Henry R. Schoolcraft and Charles C. Rafn, of a Runic inscription found in Virginia (a notice of which, with a figure, is given in vol. xii. of our own Journal); and accounts of antiquarian discoveries in Massachusetts, by Thomas H. Webb, Esq.

The work, 'Scripta Historica Islandorum de rebus gestis veterum Borealiū,' contains a Latin translation, by the Rev. Sveinbiorn Egilsson, D.D., of the historical Sagas relating to the events in Scandinavia after the inhabiting of Iceland. The Society has now published 35 volumes, comprising the original edition, *Fornmanna Sögur*, and two translations: so that there now remains only the 36th, viz. the

12th volume of the Latin series. This volume, which is in course of preparation, will, like the 12th of the text, contain a chronological view, and a complete geographical index, which, compiled for this voluminous *Cyclus*, may be considered, if not as a complete old northern geographical lexicon, at least as the most essential part of such a work.

A Historico-Topographical Committee is established in the Society for the purpose of receiving and arranging, illustrating and elaborating, those accounts and contributions which may be collected for the historical description of Denmark, and to provide for their preservation in the historical archives of the Society, in order that they may be published. The Committee have issued a programme of its intended labours, and published an historical description of the parishes of Søndstrup and Olstykke, in the northern part of Seeland, illustrated by an antiquarian map. Several similar maps of remarkable districts in the kingdom are under preparation, to be kept in the archives, and published as circumstances permit.

Danish Maps and Charts.—The Society has published a new edition, by Charles C. Rafn, of his general chart, exhibiting the discoveries of the Scandinavians in the arctic regions and America, in the tenth, eleventh, twelfth, thirteenth, and fourteenth centuries; and also of the same author's special map of Vinland, the principal seat of the ancient Scandinavian settlements in North America.

A map of the district of Julianehaab, in the S. of Greenland. This is a new and correct edition of the map, which was formerly published by the Society in Rafn's '*Antiquitates Americane*,' and was composed, by Captain W. A. Graah, R.N., from such materials as could then be had.

A map of that part of the district of Godthaab, in Greenland, which is thought to have been the site of the western settlement of the ancient inhabitants (Vestribygd), viz. Baal's River, with the adjoining fiords, and Amaraglik, composed by Lieut. C. Möller, subsequently appointed inspector of the northern part of Greenland, and who, at the expense of the Society, has travelled over several of the fiords of this district. Both these maps may be considered important contributions to the modern geography of Greenland, though they are properly to be regarded as antiquarian maps, since all the ruins of European buildings which travellers have met with are marked on them with appropriate signs, so that it may be clearly seen how considerable and how extended the habitations were in former times.

A map of ancient Iceland, with its divisions into large jurisdic-

tions—the so-called *Thing*, or court of justice—from about the year 934 to 1000, for the most part composed after, and principally for the illustration of the before-mentioned *Landnamabók*, but previously made use of in a former edition of Rafn's '*Antiquitates Americæ*.' The changes during the subsequent period were so inconsiderable that this map may be used for all the *Saga-cyclus* until its close in the fourteenth century. Even for modern and the latest times it is not useless, as the places now most remarkable were already so in former times; and generally the great majority of the names applied here are yet found to belong to well-known mountains and mountain passes, valleys, promontories, bays, fiords, rivers, lakes, hamlets, and farm-houses. Above all, the ancient names of places in Iceland, as well as the language itself, are better preserved than probably in any other country in the world.

Closely connected with the Society of Northern Antiquaries is the Literary Society of Iceland, which labours to promulgate the modern literature of that country. The Danish Government having, in the eighteenth and nineteenth centuries, had the charts of the coasts of Iceland published, this Society, notwithstanding its limited means, has had the interior of the country measured, and particular maps made of the various parts. During the summer of 1831, an Icelander, Biorn Gunnlaugssen, a man of great ability in this vocation, began the task, and continued it every summer till 1843, when he finished with the jurisdictions of Stranda and Isafjord. The King of Denmark, who takes a lively interest in all matters relating to Iceland, has granted pecuniary assistance for the reduction and engraving of the maps, which will be confided to the direction of Major Olsen. Four maps are to be published: the two which comprise the S.W. and S.E. quarters are expected to be finished and to appear in the beginning of next year.

To this must be added another undertaking, which is also considerably advanced, viz. a complete physical, topographical, and statistical description of Iceland, by the same Society. Applications were made to all the clergy in Iceland, the result of which, added to the rich collections that the archives contain, form a great mass of materials for the projected work, the physical part of which (the first to be published) will be by the naturalist, Jonas Hallgrímsson, and who has for this purpose travelled over the greater part of the country.

BELGIUM.—Maps and Charts.—With the exception of the maps and charts prepared at the celebrated establishment of M. Vandermaelen at Brussels, very little is published in Belgium; but the extent and resources of that great institution are found amply sufficient for the production of every kind of cartographic work. The zeal, talent, en-

terprise, and liberality of M. Vandermaelen are such, that few countries can boast of a greater number and variety of maps of its own territory than Belgium. Special maps are perpetually issuing from his presses, for every purpose of geography, history, statistics, and the several branches of industry, independent of general maps of Belgium and of other countries. To enumerate all that has been done, and is still doing at M. Vandermaelen's establishment, would far exceed the limits to which I must of necessity restrict myself. I shall, therefore, merely mention a few of the maps which have been published since our last Anniversary meeting:—

A map of Central America, by M. N. Dally, in four sheets; 'Mappa Chorographica da Provincia de S^t. Catharina,' by Major Van Lede; a Cadastral Communal map of Belgium, published, with special approbation of the Government, under the direction of the Inspector of the Cadaster; a separate atlas for each *commune*; a map of Belgium on the scale of 1:100,000, in one large sheet, with the names of all the communes, the railroads, ordinary roads, canals, &c.; a cantonal map of Belgium, with all necessary details; a historical map of Belgium of the middle ages; an ecclesiastical map of Belgium; a map of the country between the Sambre and Meuse; the cadastral maps in sets, differently coloured, for the use of the different administrations.

The whole of the above, with several railroad and other maps, except the two first mentioned, are from M. Vandermaelen's Geographic Establishment, in which, moreover, experiments are continually made with a view to the greater perfection of cartography.

Surveys.—The grand survey for M. Vandermaelen's topographical map of Belgium is still going on; besides which,

The country is undergoing a geological survey by the distinguished geologist M. Dumont, already so well known among men of science for his geological map of the country around Liege. The construction and engraving of this map have been, by a royal ordonnance, confided to M. Vandermaelen.

This geographer has also undertaken a special map of the levels of Belgium, in nine sheets, on a scale of 1:100,000. The levelling operations have been confided to M. Saus of the department of the *Ponts et Chaussées*.

In announcing his intention of following up his mining and commercial map of Belgium ('Carte Minière et Industrielle'), by a similar map on a general scale, intended to present, at one view, all the branches of industry which exist in Europe, this indefatigable geographer has forwarded to me, for distribution among British geographers, printed

tables of inquiry, requesting us to insert therein any knowledge we may possess of the manufactures of animal, vegetable, and mineral substances, and of the various productions of man in any European locality; and, in distributing them, I trust you will respond freely to inquiries which attest the zeal and intelligence with which M. Vandermaelen is pursuing his highly useful career.

M. Blondeel van Ceulenbroeck has returned to Brussels, from his explorations on the Nile and in Abyssinia; and M. Verheyden has lately been despatched to Mexico by M. F. Vandermaelen, brother to the geographer, in order to collect objects of natural history, as well as scientific and geographical information.

FRANCE.—In France nine additional sheets of the great map of that country have recently been published, viz., Dijon, Orleans, Cherbourg, Mortagne, Lisieux, Beaupuy, St. Claude, Belley, and Chalon-sur-Saone; six more will shortly appear.

The maps of Algeria, of which, through the liberality of the "Ministère de la Guerre," we possess a copy, have, since their publication, been greatly improved, and we are promised a copy of the new edition, in addition to a general map of that part of Africa which Colonel Denaix has just sent us.

That officer has also published a map of the Roman empire, to accompany a volume containing the 'Itinerary' of Antoninus, the Peutingerian tables arranged as itineraries, the various Periplus of the ancients, &c. Colonel Denaix has been many years employed on this great work, which will be invaluable for the study of ancient history. He has presented a copy to the Society.

To the above must further be added, by the same indefatigable geographer, a map of Marican, of Heraclea, and a map of Turkey in Asia, and Persia, extracted from a large work, on which Colonel Denaix has been long engaged, and for which he has collected very numerous materials. These maps he has also been so kind as to present to the Society.

The general map of Greece, in twelve sheets, by the officers of the French Etat Major, is in a very forward state; nine sheets are finished, and it is expected that the remaining three will be terminated next year. The Dépôt Général de la Marine continues its activity, and we learn by the bulletin that from 1842 to December, 1843, they had published ten charts and plans of the northern coast of France, eight of the Mediterranean, eight of America, three of roadsteads and islands of the Great Ocean, and fourteen of parts of the Indian Ocean, besides six nautical memoirs.

From the same bulletin we glean that a greatly improved map of Arabia has been prepared conjointly by Messrs. Chedufau and Mari, officers in the service of Mehemet Ali, and Messrs. Ferret and Galinier of the French *État Major*. These gentlemen have severally had excellent opportunities, both from personal observation and information, of adding to our knowledge of the mountain chain of Yemen and the Hedjaz.

From the Anniversary Address delivered by M. Berthelot to the *Société de Géographie de Paris*, it appears that M. Mallet of the corvette the *Émbarcadore* has obtained important hydrographic details of the group of Wallis Islands, and of the passages into the several mooring grounds.

M. Adolphe Delessert has published his '*Voyage dans l'Inde, exécuté de 1834 à 1839.*' This work, besides an account of the continent of India, contains some interesting details on Prince of Wales' Island, and also some notions on Singapore and Samboangan.

A translation of a portion of Mr. Horace Hayman Wilson's account of Moorcroft and Trebeck's travels in India has been lately published in French by M. O. Mac Carthy.

Dr. Robert is, we believe, still travelling in Upper India. The route he has marked out for himself is very extensive, and if, as we hope, he succeeds in accomplishing his undertaking, he will clear up some doubtful and important points of Oriental geography.

M. Sainte Croix Pajot is about to undertake a journey in South Arabia, which country he intends, if possible, to traverse in its whole extent, between Yemen and Muscat.

M. Hue, a French missionary, is travelling, it would appear, in disguise in the interior of China, and much valuable information may be expected from his adventurous undertaking.

M. Baldus, also, a missionary residing in China, has sent home to France the results of his observations in a correspondence with the superior of the congregation of St. Lazare. These communications, however, relate chiefly to the manners and morals of the Chinese.

It would appear, from the recent edition of a Chinese map lately sent to Paris, that the mouth of the Yellow River has shifted to the enormous distance of 125 leagues from its former position, when the map was originally constructed, in the eighteenth century, by the Catholic missionaries; and M. Biot, who has written learnedly upon this subject in the *Journal Asiatique*, is of opinion that analogous changes may have taken place in many other great rivers, but that the amount of such changes is unknown, from the want of historical annals.

M. Le Comte Jaubert has lately published, in two handsome volumes, an account of the travels in the East of the lamented M. Aucher Eloy; these travels include Greece and the Archipelago, Turkey, Egypt, Syria, Asia Minor, Galatia, Armenia, Azerbaijan, Mesopotamia, Persia, and the country of the Bakhtiari, Bander Abassi, Muscat, and several parts of Southern Arabia. M. de Jaubert has accompanied the account of the traveller's labours by a just eulogium of the traveller himself.

Captain Haines's account of his surveys of the coast of Arabia, contained in our Journal, has lately been translated into French by M. Pissana.

The occupation of Algeria by the French has been productive of a fresh accession of geographical and other knowledge of that portion of Africa. Besides the maps already published by the *Dépôt de la Guerre*, and which are constantly being improved, various memoirs have appeared in different French publications. Among others I may mention a description of the Algerian Sahara, by M. Ismaïl Urbain, published in the '*Revue de l'Orient*'; an account of the Roman antiquities of Oran, and of the ruins of Taret, published in the '*Spectateur Militaire*,' &c.

In the Bulletin of the Geological Society of France will be found an able memoir on a very interesting subject of physical geography, by M. Angelot; it is entitled '*Researches on the Origin of the Saltiness of various Lakes existing in the depressions of the Soil of the Continents of the World, and particularly of that of the Dead Sea*,' &c.

M. Jomard, we learn, is still actively continuing his collection of ancient maps, a work of great interest, whether as regards history or comparative geography.

M. Derjardins, we are informed, has contrived a plan of representing the objects of geographical science in such a way as to leave a more vivid impression of them on the mind of the student. Should he have succeeded, he will have done good service.

The first volume of a work by M. Fontaine, Vice-Consul of France at Busora, is producing a considerable sensation in Paris, and will most likely soon appear in an English journal. He has had great opportunities of becoming acquainted with the different nations of the East, and has made the geography of some parts of the country his peculiar study. He has been enabled to throw much light upon the immediate neighbourhood of the Persian Gulf, and the information, both political and commercial, he has gained will prove of great value. Of the present state of Busora he gives an interesting account. The second volume will contain his observations on Bombay, where he was received

with true English hospitality. ('*Illust. Polytec. Review*,' March 30th, p. 152.)

NORTH OF ITALY.—Bologna.—We have lately been favoured by Count Hannibal Ranuzzi with a 'Notice on the Progress of Geography in Italy,' by which it appears that various local and general maps, dictionaries, &c., have lately been published throughout Italy, many of which have already been mentioned in my predecessors' Addresses. This industrious geographer is now publishing an 'Annual' of Italian geography, which, from a statement of its contents, seems to promise well. The subjects mentioned are,—Notes on Genoese navigators, prior to the discovery of America; on the Apennines of Tuscany; the geology of Piedmont; list and results of some of the more recent earthquakes; on the decrement of heat in various parts of Italy and Savoy; on the separation of Southern Calabria from the Peninsula of Italy, in the tertiary sub-Apennine period; travels along the sea-coast of Tyrrhenia; letters of Colonel Visconti to Comte Graberg af Hemsö; result of the labours of the mineralogical, geological, and geographical section, during the Fifth Scientific Congress, held at Lucca in 1843.

We are also informed that an edition of Balbi's ' is in course of publication at Naples, with notes, &c., by De Luca.

We owe to the Geographical Institute at Milan a beautiful topographical map of the duchies of Parma and Piacenza, in nine sheets, which Azzi has reduced to one sheet. Their last work has been the engraving of the map of the state of Este; it was made by the corps of engineers, and is based on a triangulation connected with the duchy of Parma and the kingdom of Venetian Lombardy. Here, too, we may notice the more extended geodetic and hydraulic operations of late years, and the numberless levellings effected with a view to the projected railroads from Milan to Venice, also to Mantua, Como, and Genoa. The examination of these lines, in connexion with the best ascertained water-slopes, and the many data already acquired from other operations on the roads, aided also by barometrical observations, will compose a comprehensive work on the declivities of the territory north of the Po hardly equalled in any other part of Europe.

Florence.—Dr. Attilio Zuccagni Orlandini of Florence is preparing a new general map of Italy in fifteen sheets, on the scale of 1 to 600,000, a work which will doubtless be much valued by all classical as well as geological explorers of that peninsula; and here it is to be remarked that the author of this map attempted, fifteen years ago, to carry on a journal specially dedicated to geography, which was abandoned for want of support; and it is in the establishment of the same geographer, the

author of the '*Corografia Fisica, Istórica, e Statistica dell' Italia*,' that some of the best engravers of that country have found employment.

In the past year the same establishment has produced a map of Naples in the time of the Romans; a new plan of the city of Rome; six small maps of parts of the Pontifical States, &c., based on the triangulation of Inghirami, and new maps of Elba and the Vianosa.

In Florence a small map is in preparation, by Stanghi and Pozzi, of Parma, Lucca, Modena, and Tuscany, to accompany a work by Eugenio Alberi.

Austrian Survey of Italy.—An official commission of the Austrian *État Major* is ascertaining, by triangulation, the real range of the central ridge through the Pontifical States, to quadrate with that already determined in the North of Italy and in Naples, and thus to form an accurate net-work of the dominant physical features of the peninsula. The same institution, founded at Vienna, is about to produce a map of Italy in twenty-six sheets, on the scale of 1 to 288,000, like that of the Lombardo-Venetian kingdom, published in 1838.

When, however, we speak of the efforts of "*Oltremontani*" to promote a correct study of geography in Italy, it ought to be remembered that, as Italy produced geologists such as Moro and Scilla, at a time when our northern countries had no conception of the science, so had she, it appears, in her poet Guadagnoli D'Arezzo a real geographer; for he constructed tables in relief to show the relations of mountains, valleys, lakes, and rivers,—thus first striking out the idea of the relief or model maps which have been since so much improved. Many other works on the North of Italy, and by Italians, are in progress: such as a dictionary by Repetti, already at its fifth volume; a geological map, which, at first referring to the Island of Elba only, is to comprehend all Tuscany; and geological maps of Sardinia and Liguria, by the Cavalier Marmora and the Marchese Pareto, both very distinguished geologists. Of the progress made in the great map of Piedmont directed by General Annibal Saluzzo, we have not any precise information; but I hope very speedily to announce the completion of a work in which, in common with all others more specially occupied in my own branch of science, I am anxiously looking for—the geological map of the Piedmontese Alps, by that indefatigable and able explorer, M. Sismonda of Turin.

In the Lombardo-Venetian kingdom the lakes of the plain of Erba (accompanying his minute topographical map of Milan and its environs) are about to be represented by Brenna; whilst even San Marino has put forth its statistical and historical volume, with a map of the territory of the republic, which will appear in the '*Corografia Italiana*' of Zaccagni.

NAPLES AND SOUTH OF ITALY.—Happily on this occasion I need not confine your notice to the North of Italy, for the Government of the Two Sicilies has at length taken measures to secure the correct delineation of this kingdom. Our associate, General Visconti, informs us that the triangulation of the first order, which was extended southward from the Austrian territories through the Pontifical States, was first applied to Naples in April, 1843, by the measurement of a parallel between the Island of Ponza, opposite Gaeta on the W., which, passing to the S.E. of Monte Circello, stretched to the little city of Fasano, in the province of Bari, and near the Adriatic on the E. Along this parallel observations were made upon the falling stars, with a view of ascertaining whether, in that serene climate, it was possible to determine thereby the differences of longitude between different parts of the same arc. The results were highly satisfactory, and have led to the continued use of this method. The eastern territory, between Naples and Fasano, on the Adriatic, is said to be already measured, and the western portion of the triangulation, in the same latitude, will be completed this year. The triangulation of the second and third order was carried, in 1842, along the coast of the Abruzzi, and has made much progress in the Terra di Lavoro.

The great map of the kingdom of Naples, on the scale of 1 to 20,000, has been continued between Sora, Gaeta, and Venafrò, *i.e.*, all along the wild country which forms the boundary with the States of the Pope, and part of the Abruzzi.

A map of the environs of Naples, in fifteen sheets, and on a scale of 1 to 25,000, is fast advancing to termination, and will be completed in two years; and three sheets of the topographical map of the whole kingdom, on the scale of 1 to 80,000, exclusive of the map of the city of Naples, are already prepared. A small general map will be reduced from the larger scale, and a historical and civil dictionary will illustrate all these works.

The engraving of the hydrographical map of the Mediterranean, in three great sheets, intended for the use of the Neapolitan Navy, will very soon be issued; and it is said that the topographical plan of the Faro of Messina (1 to 10,000) will be finished this year. Those who wish to acquaint themselves accurately with the methods which have been employed in preparing the materials for the chief of these results, will do well to consult a Report made to the Royal Academy of Sciences of Naples, by Captain Yergola, who has taken the leading part in the triangulation of the kingdom from the year 1833 to the present date.

Thus we see that the great vacuum which has hitherto prevailed in

all the maps of Italy is about to be filled up, and that, availing themselves of the observations of the Northern Italian geographers, Inghirami and Marini, the Austrian Government deserves our warmest thanks for having, by its example and influence, extended and spread through the peninsula the same beautiful system of mapping which it has already applied, with so much effect and with such striking precision, to its German territories—the value of which I have often put to the test in my geological rambles, whether in the Eastern Alps, or along the confines of Hungary and Poland.

AUSTRIA.—In Austria Proper there have been lately published,—Wolney's topographical work, with six small maps of the Circles of Moravia, by Conr. Schenkel, at Brünn, and a description of Innsbrück, by Charles Schleich.

Of maps, there have appeared, the last sections of the environs of Vienna and Baden, drawn on stone, and coloured in the same way. This work is now completed; it has been executed by the Military Geographical Institute, and is in the scale of $\frac{1}{112,500}$.

The environs of Vienna and Baden, engraved on stone in three large sheets, on the scale of $\frac{1}{112,500}$, by the same.

The valley of the River Inn, from Zirt to the Bridge of Volters in Tyrol, scale $\frac{1}{112,500}$, by Pfeudler, at Innsbrück.

A new port map of the Austrian States, under the direction of the Port Administration at Vienna. 2nd Edition. Also a Railroad map of Germany, published at Vienna by Artaria and Co., and a perspective map of the Danube from Vienna to Buda, by Hummitt.

Artaria and Co. have also published a geological map of the country from Olmütz, in Moravia, to Gratz, in Styria; and a geological map of Vorarlberg, with profiles, has been prepared by Auten, Schmidt, and Lithochromed, at the Military Geographical Institute.

The application of lithography to the colouring of maps is, I believe, a new feature in the art, and one which is likely to be serviceable to cartography.

Of Austrian surveys, we hear that the survey of Bohemia, and that of Hungary on the left bank of the Danube, will be continued, and that a detachment of officers is about to be despatched to the right bank of the river. The scale of these surveys is $\frac{1}{112,500}$.

The trigonometrical operations in Transylvania and in Hungary will be finished this year. An azimuth will be measured near Lemberg, in Galizia.

The institute already mentioned is now engaged in engraving on copper the special map of Moravia, in nineteen sheets, on the scale of

1818, and the general map of the same country in four sheets, on the scale of 1818. Some *livraisons* of the former of these, it is expected, will soon appear.

SPAIN.—*Maps.*—Of maps and charts there have been lately produced in Spain—A map of the eastern coast of Africa, including the island of San Lorenzo, or Madagascar, and the Mozambique Channel; a chart of the gulf of Tremezen, as far as Bujia; a chart of the harbour of Santander; a map of the coast of Africa and the island of Madagascar; a map of the southern portion of the coast of Africa, comprising the Cape of Good Hope, and a chart of Table Bay; a chart of Dampier Straits; a chart of Cape Berga to Gran Lahou, on the west coast of Africa; a chart of the Indian Ocean, with a part of Hindostan and the island of Ceylon; and a chart of the harbour of Castro Urdiales.

PORTUGAL.—The Royal Academy of Sciences of Lisbon are printing a collection of notices for the history and geography of countries beyond the sea, which among other curious matters will contain information on the Molucca Islands, according to the relation of Gabriel Rebello, in the 16th century.

The same learned body have also just published the first volume of reprints of *Opuscula*, relating to the migrations, conquests, and voyages of the Portuguese. This first volume contains the account of the discovery of Florida.

There has been published at Oporto the first sailing directions (*Routier*) for the coast of India, between Goa and Dio, by D. Joan de Castro, with an atlas. Captain Kopke, who was its editor, is just dead.

The second volume of the Portuguese translation of the *Travels* of Ibn Batouta, published by the Academy of Sciences, is about to appear.

Maps.—Colonel Frarini, known by different works, and among others, by his chart of the coast of Portugal, engraved by Mr. A. Arrowsmith in 1812, has just finished his map of Portugal on the scale of 1818. This map will be accompanied by a statistical, political, and administrative notice, and by a list of heights of the principal mountains of the country; it will be lithographed in Germany.

NORTH AMERICA.—You are all well acquainted with the discoveries on the N. coast of America, made by Messrs. Dease and Simpson; and it is still fresh in our memory that the Council, in token of the high value of their daring and successful explorations, awarded them one of the Gold Medals. From the very active part taken in the labours of the expedition by Mr. Thomas Simpson, the second in command, there can be but one feeling of the deepest regret that so enterprising and able an explorer should not have lived to enjoy his justly acquired fame. His

brother, Mr. Alexander Simpson, has, however, taken upon himself, and ably performed the duty, of publishing the narrative of the brilliant discoveries alluded to, a work which has, no doubt, been read by many, with that degree of pleasure which the modest and unpretending recital of dangerous and successful exploits never fails to excite. In addition to the volume in question, Mr. Alexander Simpson has most obligingly presented to us the original extended charts of the discoveries, drawn up by his brother; the Governor and Directors of the Hudson's Bay Company having kindly given them up to Mr. Simpson for that purpose.

Cree Language.—Closely connected with the discovery of new lands is the illustration of the languages spoken by the aboriginal races of mankind. In furtherance of this department of knowledge, the Royal Geographical Society aided from its funds the recent publication of a grammar of the Language of the Cree Indians, by Mr. Joseph Howse; a long and arduous labour, for which, from a long residence in the country of that people, that gentleman was peculiarly fitted. On this as on other occasions, we geographers, though looking chiefly to ethnography, were most happy to co-operate with a Society instituted for the purpose of diffusing Christian knowledge; and whatever may be the future fate of the remaining tribes of this remarkable family of the human race, which seems to be passing away so rapidly from the surface of the earth, I congratulate this Society on having been instrumental in procuring a perfect record of one of their most widely diffused dialects.

Isthmus of America—Projects of Communication between the Atlantic and Pacific.—The Memoirs of Mr. Bailly and Mr. Wheelwright, read before us during the last Session, on the eligibility of opening out a communication between the Atlantic and Pacific Oceans, have revived the consideration of designs which were formerly brought into public notice. In the palmy days of her conquests Spain must doubtless have contemplated such a task, and according to a French writer,* the scheme was even entertained by Cortez himself. At a later period the Spaniards seem again to have thought of it, for the celebrated Don Juan de Ulloa was perhaps the only man of science during the last century who passed over the isthmus with instruments of observation. Yet even he left so few and such imperfect results on record, that when the great explorer Humboldt made us, for the first time, really well acquainted with the general structure of South America and Mexico, he dwelt with deep regret on our ignorance of the physical features of nearly the whole

* M. Darondeau, *Annales Maritimes*.

region of the isthmus. Comparing, however, the various sources of approximate knowledge, he urged in an energetic and eloquent appeal the accomplishment of more precise and detailed surveys.

The inhabitants of South America having thrown off their allegiance to Spain and established independent governments, every sort of scheme for the improvement of the country being hastily suggested, it was natural that the passage of the isthmus should be one of them, and in the year 1825—so memorable for the overwhelming ruin of many of our countrymen by South American Companies and their failures—all the projects for the execution of a great canal between the two seas which had been at any time discussed, were collated by Mr. Pitman in his "Succinct view of the practicability of joining the Atlantic and Pacific Oceans." Endeavouring to interpret the evidences—many of them contradictory—which are to be found in the narratives of the Old English buccaneers, he arrived at the conclusion, that of the five lines of communication which had been suggested, that of Darien was the most attractive on account of the excellent roadsteads in both seas on that parallel, though the cutting through the cordillera, which is there steep and lofty, it was admitted, would be an expensive operation. The other four projects which this author rejected were, 1st. The joining of the rivers S. of Darien, in the province of Choco; 2dly. The union of the waters of the Chagres, and of its affluent the Trinidad, with the streams near Panama. 3rdly. The union of the Gulf of St. Juan, through the river of that name and the Lake of Nicaragua, with the Gulf of Costa Rica, or by other lateral terminations on the western and northern parts of the Lake Nicaragua—and lastly, the execution of the line formerly much countenanced by the viceroys of New Spain, viz., to connect the River Huasacula on the Gulf of Mexico with the Bay of Tehuantepec in the Pacific.

The last mentioned of these lines has been much spoken of lately, and I have had some conversation thereon with M. Moreau, an able engineer, who has closely surveyed the country, and who is prepared to show, both from the map of that tract executed by our corresponding member Don Juan de Olzago, and sent to us in 1825, as well as from his own observations, that whether the nature of the rivers, the abundant population, or the capability of the opposite sides be considered, this Mexican communication is highly desirable. On the present occasion, however, I must specially direct your attention to the two projects which have been distinctly brought before us by Mr. Bailly and Mr. Wheelwright. The first of these gentlemen, enlarging upon the previous excellent account by Mr. Laurence of the River St. Juan and the Lake

of Nicaragua,* has minutely examined that portion of this line which lies between that Lake and the Pacific. In this survey he found the watershed to be 615 feet above the sea level, and composed of a soil easy of excavation; and from these and other considerations he conceives this line to be very preferable to that between Chagres and Panama, along which he contends four different streams would have to be deepened, controlled, and rendered navigable.

The objections to the line of Panama, as formerly noted by Mr. Pitman, were the supposed height of the central ridge, the absence of any convenient large port near Panama, the shelving and shallow shore of the Pacific at that point, the insalubrity of both coasts, and the want of an adequate supply of manual labour. Since that time, however (1825), Captain Lloyd, a skilful English surveyor, determined with precision the real levels between the two seas in the parallel of Panama, the expenses of his survey being defrayed by General Bolivar and the Columbian government. The elaborate and valuable researches of Capt. Lloyd, which are recorded in the Transactions of the Royal Society, were therefore the first which removed the old and erroneous belief in the existence of a high and persistent central ridge, whilst they also answered the question of whether the Pacific Ocean was higher than the Atlantic? They in fact demonstrated, that in this latitude the cordillera dwindles into a series of isolated hillocks, amid which a watershed, 633 feet only in height, separates the one sea from the other; and making due allowance for the respective rises and falls of those great masses of water whose tides are necessarily influenced by the form of the coast and periodical winds, it was proved that to within a very slight difference their levels were the same. Thus the disgrace, which till then hung over civilized nations, in the energetic remonstrance of Humboldt, was wiped away by our countryman Lloyd, and one of the anticipations of the great geographer respecting the equalization of the levels of the two oceans was completely realized.

The Memoir of Mr. Wheelwright, to which I have alluded, is simply a praiseworthy endeavour on his part to sustain and extend the value of the researches of Capt. Lloyd (whom he accompanied), in doing which he brings forward his own arguments, formed after a long residence in that country, in support of some effort being made to open a communication across a tract which presents so few physical difficulties. He tells us that the Bocca del Toro on the Atlantic will serve as a roadstead for the largest fleets, and that coal is to be had along its shores—that with steam-power the ascent of the Chagres and Trinidad rivers, to a certain

* Read before this Society, and published in the 'Nautical Magazine.'

point of portage, could be easily effected, and that from thence to Panama the intercourse, whether by a common road, tram, or railroad, or by a canal, could be so conducted as to wind through low hillocks presenting no sort of obstacle.

Among these conflicting opinions it is no easy matter to come to a right conclusion as to the most eligible line; but should no great canal be executed in our day by which vessels should pass from one ocean to the other without breaking bulk, let us hope at all events that one of the more modest propositions of Mr. Wheelwright may be adopted, and that, if only for the benefit of the coasting trade of both shores, some easy and practicable route for passengers and goods may be speedily established between Chagres and Panama.

BRITISH GUAYANA.—*Schomburgk.*—From British Guayana we have heard of the late explorations of our well-tried and enterprising associate the Chevalier Schomburgk. Leaving George Town in February, 1843, he arrived at Pirara on the 24th of March, where he joined the rest of his party. On the 30th of April they started, and the state of the Rupununi, swollen by the rains, allowed them to ascend that river to a height never before reached with canoes so large as theirs. From the Kepununi, the party having to continue their route overland, the canoes were sent back under the command of Mr. Fryer, while Mr. Schomburgk, accompanied by Mr. Goodall, directed his course across the Carawaimi Mountains. In the course of his route in this part of the country he found indigenous cocoa-trees in the greatest profusion; and observes, that “these inexhaustible stores of a highly-prized luxury are here reaped solely by the wild hog, the aguri, monkeys, and the rats of the interior.” On the 8th of June they reached a settlement of Taruma Indians, on the river Cuyuwini, but measles and small-pox had done their work of destruction since Mr. Schomburgk’s last visit to these people, whose number had decreased from 200 to 30. Descending the Cuyuwini, in woodskins or bark canoes, they again entered the Upper Essequibo on the 21st of June. Several days’ journey above the confluence of the two rivers, Mr. Schomburgk discovered a plant having an edible tuberous root of the size of the largest yam, which, if it could be made to succeed on the coast region, would be a valuable addition to the esculents of George Town, where he distributed seeds accordingly.

At the mouth of the Urana, which enters the Essequibo in about $1^{\circ} 37'$ N. lat., the travellers abandoned their woodskins, and continued their course inland; and, after crossing a chain of hills, arrived on the 13th of July at the sources of the Onororo, a tributary of the Essequibo, and ascending an elevation of about 100 feet higher than the origin of

the first river, reached the sources of the Caphiwin, or Apiniau, the head waters of the large river Trombetes, which flows into the Amazons. The chain of hills is here 2000 feet high, and forms the watershed between the basin of the Amazons and that of the Essequibo. Here they found the remains of the once powerful tribe of Maopityans, who had, neither the means, nor apparently much inclination, to afford the travellers any assistance. Collecting, however, what provisions they could, and preparing fresh woodskins, they commenced their descent of the Caphiwin, being told that the next stage could not be reached in less than eight days. The navigation of the river was particularly perilous, on account of the number and height of the falls. On the 29th of July they reached the confluence of the Caphiwin with the Wanamu, the united streams being called by the natives the Kaphu. At this time the travellers had already been eleven days from their last starting-point, and were informed by a party of Zarumata Indians that they would have to ascend the Wanamu for eight days more before they could expect to find an Indian settlement. These Indians could not give them even so much as a plantain, so that they were greatly straitened for food (Ath., p. 1091; see also p. 1093). On the Caphiwin, a little above its junction with the Wanamu, and to the eastward, is the formidable tribe of Tapir Indians, who are said to be cannibals, and to form drinking-vessels of the skulls of their vanquished foes. Mr. Schomburgk, however, could nowhere find the far-famed Amazons, who, according to Herrera and Acusha, opposed the landing of Orellana at the mouth of the Cunuriz, the present Trombetes. Our traveller now ascended the Wanamu, where a circumstance occurred which, but for his admirable judgment and courage, might have been attended with the sacrifice of the whole expedition. Proceeding northward, and ascending Irian, Mr. Schomburgk was again obliged to abandon his canoes, and, alas! the greater part of his collection of objects of natural history and ethnology, for want of a sufficient number of Indians to carry them. After extraordinary fatigue and privation, the party at last reached, on the 21st of August, the first small stream that runs towards Corentyn, and came to a settlement of Drio Indians, who received them in the kindest manner, and even sent for and fetched the baggage left behind. For the third time the party had to construct woodskins, with which they hoped to descend to the coast. Having filled their canoes with as much provision as possible, and, accompanied by their ever-faithful and trusty Macusi Indians, the party commenced their route for the coast region on the 6th of September. No one knew the river; but they were told that in ten days they would reach a native settlement. Many rapids were

met with, in succession, which, though not dangerous, were exceedingly harassing to the party. One fall, however, more formidable than the rest, and where they had to unload their canoes, was called, by Mr. Schomburgk, "Sir Walter Raleigh's Fall." The course of the Corentyn is described as being spread out to the breadth of several thousand yards by the rocks and islands with which it is intersected and studded: nor was there the slightest trace of man having ever visited these solitudes. Instead of ten, fourteen days had already elapsed, and no sign of any settlement appeared; and all the provisions were consumed, except a basket of farina. Each voyager was therefore, of necessity, put upon the short allowance of six ounces of farina per day. The history of the succeeding ten days is a record of nothing but difficulties and dangers overcome, and privations and sufferings endured with courage and uncomplaining fortitude. Of all the rivers he had ever visited, Mr. Schomburgk says the Corentyn is the most perilous to navigate. The canoes now began to show the effects of cataract navigation, and the travellers had to tear off pieces of their clothing to stop the leak-holes, hourly increasing by fresh collisions against the rocks: indeed, they were obliged to abandon one of the canoes. At last, on the morning of the 28th of September, they reached the foot of the great cataracts visited by Mr. Schomburgk in 1836; but four days of privation and fatigue were still before them, ere they could hope to reach a Carib settlement; and only a few pounds of farina remained for the party, consisting of fifteen individuals: "And when," says the explorer, "I threw a glance upon the emaciated forms of my Indian companions, the very word to urge them to paddle stronger died upon my lips." On the morning of the 1st of October, the last morsel of farina was shared out, amounting to something more than two ounces for each individual. Stern necessity now urged them to a last exertion of their failing strength; and, fortunately, they were soon cheered with the sight of the first Carib settlement, where their wants were speedily supplied. The next morning Mr. Schomburgk continued the journey, leaving Mr. Goodall to follow more leisurely with the rest of the party, the following day. Ultimately, on the 13th of October, the whole party reached George Town. Thus had this most enterprising and able traveller completed the circuit of the colony of British Guayana. In a letter to our Society, alluding to this last exploration, and to his labour in Guayana generally, Mr. Schomburgk says, "This has been the most interesting journey I ever undertook; our fatigue and privations have been great, we all arrived upon the coast like walking skeletons: but it is with pride and satisfaction I can add, that, whatever have been our dangers, not a

single individual has perished in the undertaking, which has occupied us since 1841."

If I have dwelt longer upon this journey than is strictly consistent with the nature of an Address like the present, it has been because the details of this expedition, having been printed elsewhere, cannot, according to our rules, find a place among the papers in our Journal; and I have thought it desirable that this crowning labour of a gentleman whose early explorations were acknowledged by this Society with one of its medals, should be noticed from this chair as it deserves. Few men are better formed than the Chevalier Schomburgk for the very arduous task of conducting exploratory expeditions in unknown regions. Conciliatory in his manners, yet firm, cool in judgment and prompt in action; inured to privation and fatigue, and undaunted by difficulty and danger, zealous and persevering—such is his moral character; and when to this are added his various acquirements as an astronomical observer, as a botanist and naturalist, it will be conceded that he is one of the first travellers of the day—one of those, in fact, formed in the school of Humboldt, whose researches and observations extend alike over every subject of interest, and make us fully acquainted with the regions they explore.

AUSTRALIA.—Notwithstanding the arduous travels of so many of our countrymen, many of whose labours are recorded in our volumes, or in the general literature of our country, there is no part of the world to which British influence has extended, which contains such vast tracts of yet untrodden ground, nor any one in which so great a geographical problem remains to be solved as Australia. It is therefore with satisfaction I have recently perused the report of a select committee of the Legislative Council of Sydney, upon the endeavour to establish an overland communication between the settled districts on the south, and Port Essington on the north of that vast continent.

If we are to confide in the clear and decisive testimony of Sir Gordon Bremer, and other naval officers, including Captain Everard Home, as well as in that of Mr. Earl and Captain M'Arthur, who have thoroughly examined the regions around it, we should be led to think that in all her schemes of future commerce, Great Britain has rarely had it in her power to place her standard on a more desirable spot than Port Essington. With an outer harbour, capable of containing the whole British navy, and an inner harbour, in which twenty-five sail of the line can lie at ease; with a climate peculiarly healthy to Europeans, in which spices, indigo, sugar-canes, the cotton and the choicest woods can be grown in abundance, whilst the sea swarms with the finest fish; this port further offers the great advantage of having a quiet and industrious race of inhabitants in the adjacent islands, who, as well as the more active

inhabitants of Timor and the neighbouring isles, and also the Chinese, are ready to flock to the settlement. I am, indeed, led to believe, that no sooner shall our government render Port Essington a permanent and independent colony of the Crown, than several rich mercantile houses in London will at once set up establishments there, and freight large vessels for the trade which they would carry on through it with the Eastern Archipelago and China.* Already many of the enterprising Malays resort thither for the fisheries, and are ready to exchange their salted fish and other products for British cottons; and as an *entrepôt* it is daily becoming more important from the rapidly increasing intercourse between our Australian and Indian possessions. Grand as is the future prospect of intercourse with India, the Eastern Islands, and China, Port Essington is not, however, to be viewed merely in reference to commerce. As a place of refuge in a wide ocean it has a strong claim upon our nation, and it has already even in its infant state been the means of saving the lives of crews who had taken to their boats, even as far off as Torres Straits. In this respect, indeed, a more intimate acquaintance with the Gulf of Carpentaria and Torres Straits, so dangerous from the adjacent coral reefs to ships which try that passage, may lead to the discovery of an additional harbour in its vicinity. But independently of this consideration, Port Essington ought to be viewed as a most advantageous naval station for Great Britain in case of war; and with the extension of steam navigation, it is further to be regarded as the point by which in all probability our future correspondence with our South Australian colonies might be most expeditiously and beneficially carried on.

With such attractions therefore held out to them, and seeing in this port (undoubtedly one of the finest in Australia) a probable outlet for their own productions, it is quite natural that the legislature of Sydney should have made the recommendation to which I have alluded, and which all geographers must heartily wish may be carried into effect, however they may differ in their mode of accomplishing it.

Before the feasibility of any scheme can be judged of, we must fairly picture to ourselves all the physical conditions and general outline of Australia. In all other continents of so large a size, many large rivers occur; but with the exception of the Darling and its tributaries, which flow to the west and south-west, and where the region is comparatively narrow, all the explorations of the northern and western coasts (where

* I learn from my accomplished friend, Capt. Owen Stanley, R.N., who was employed in surveying during upwards of two years in these regions, that Port Essington has the disadvantage of being exposed to occasional tornadoes—inseparable perhaps from tropical stations. This intelligent officer is of opinion that great benefits might follow, from an accurate survey of the very fertile and well-peopled islands to the north of Australia, and which are grouped around Timor.

the country has a breadth from E. to W. of 2000 miles) prove the non-existence of the mouths of great streams. On the east coast, on the contrary, rapid flowing streams with short courses abound. These results stem indeed to follow from what we already knew of the outline and nature of the surface. The only great and persistent axis of the country as determined by its elevation and the crystalline structure of its rocks, is the long, low cordillera, which trends on the whole from N. to S., and at a short distance only from the eastern coast. The journey of the late Mr. Cunningham, who traced this ridge to 27° S. lat., in the parallel of Moreton Bay, and the numerous traverses of it by Sturt, Mitchell, and other travellers in their exploratory passages to the interior, had necessarily made us acquainted with it at many points.

Another traveller, M. de Strzelecki, who has already given some short accounts of a southern portion of this chain, will shortly appear before the public with an important work explanatory of its general structure and physical features. Passing five years in the country, he traced these mountains continuously on foot from 31' to 44° S. lat., and whilst making this survey, which obtained for him the warmest approbation of the Governors of New South Wales and Van Diemen's Land, Sir George Gipps and Captain Sir J. Franklin, R.N., M. de Strzelecki repeatedly crossed it, and examining its lithological characters in detail, ascertained that it had a mean altitude of about 3500 feet, and was on the average 70 miles distant from the sea. In Van Diemen's Land he found the axis of the same crystalline rocks to be prolonged in a curvilinear direction, whilst to the north of our settlements of New South Wales, he found by sailing along the coast the same chain, there coming close to the sea, as determined by the admirable survey of Captain P. King, was persistent to Torres Straits at the north end of the Gulf of Carpentaria, and that on the north side of these straits it is again prolonged in the same direction far into New Guinea.

With the exception then of a few embranchments towards its southern end, which throw off the waters of the Darling and its tributaries into the new settlements of South Australia, and of the curvilinear band in Van Diemen's Land, this chain may be said to have a meridian direction through upwards of 35° of latitude, and is therefore considerably longer than the Ural, another great meridian chain, of which I have elsewhere spoken, even if we include in the latter the great islands of Nova Zemlia. The Australian chain further resembles the Ural in being composed, according to Strzelecki, of an axis of eruptive or igneous rocks (greenish syenite, greenstone, porphyry, serpentine, &c.)—some metamorphic rocks (quartz rocks and slate) with unquestionable pa-

læozoic deposits on either flank. It still further resembles the Ural in altitude and in the total absence of all free transported blocks or boulders, all the alluvia or diluvia being local; but it so far differs from the Ural and many other meridian chains, in having as yet offered no trace of gold or auriferous veins. Apologising for having momentarily drawn your attention to a comparison between this Australian chain, and one with which I am acquainted, I must refer you to the forthcoming work of M. de Strzelecki, for many mineralogical and geological views, as well as for barometrical and meteorological observations made over a very large area by that intrepid and intelligent traveller, entirely for the love of science, and at his own expense.*

The point for our present consideration is, whether, when explored to the north, this Australian cordillera is likely to afford on its western flank a sufficient quantity of water to support any travellers who may attempt to pass across the country which lies to the west of the cordillera, and so to reach the head of the Gulf of Carpentaria? As no great rivers are found to empty themselves upon the western or northern shores of this continent, as ascertained by the explorations of Grey, Lushington, Wickham, Stokes, King, &c., and as it cannot be doubted that waters must be thrown off inland from the eastern cordillera, the interesting points to determine are the true nature of the country which approaches to that chain on the west, and how the streams are absorbed or lost. Basing their opinions upon the absence of the mouths of great rivers upon the west, and also judging from the character of the country into which they have penetrated, our most intelligent explorers (among whom I would particularly cite Governor Grey) are of opinion that the chief mass of the interior will be found to consist of valueless jungle, marsh, and sand—the desiccated and slightly raised bottom of an ancient sea—in which, deprived of good streams and subjected to an inter-tropical climate, civilized man could only look for the most scanty means of subsistence. The sterile nature of a portion of the country extending to the north of the settlement of South Australia had been to a great extent determined by Lieutenant Eyre; but the subsequent researches of Captain Frome, the surveyor-general of that colony, have indeed rendered the account still more striking, for he has ascertained that what appeared to Mr. Eyre to be the south-eastern end of Lake Torrens, was in fact a mere sandy desert, at a height of 300 feet above the sea, with a few low sand ridges rising out of it, which to him, as well as to Lieutenant Eyre, appeared by the refrac-

* M. de Strzelecki has prepared a most valuable and colossal geological map of New South Wales and Van Diemen's Land, which he cannot publish at his own expense: it is well worthy of the patronage of the British government.

tion of the atmosphere to be a lake with islands until absolutely examined. This desolate tract, in which salt springs abound, and in which fresh water is only known in occasional floods, may I apprehend be taken as a type of large portions of the interior of this singular continent, and even in this comparatively narrow portion of it, great must be the privations even of those who effect a passage from the inland points of Southern Australia to that part of the banks of the Darling, already known to us by the surveys of Mitchell.

But to return to our object—the traversing of the continent from New South Wales to the Gulf of Carpentaria. From what point ought the exploratory expedition to start, and what direction should it take?

Commenting upon the relative advantages of a departure either from Fort Bourke, the most north-western settlement of the colony, or from Moreton Bay, the Committee of Sydney, guided by the opinion of Sir Thomas Mitchell, give the preference to the former. It would ill become me to set up any opinion which I may hazard against that of Sir Thomas Mitchell, so distinguished for an acquaintance with that country; but I cannot avoid stating that Fort Bourke, already a long and tiresome march from Sydney, seems to me to be much too far removed from the Eastern cordillera, from whence any regular supply of water can alone be looked for. As yet we know but of one small river on the right bank of the Darling, and as the tract N.W. of Fort Bourke is slightly elevated, and we also know from the former survey of Capt. P. King, and from the recent surveys of Capts. Stanley and Stokes, that a few degrees further N. the cordillera runs close along the sea-coast, so does it seem to follow that, if the explorers are to depend upon any supply of water flowing from that chain, they would necessarily have to traverse several hundred miles of land before they fell in with it. The case is simply this: granted that the cordillera be found to throw off waters to the W. as well as to the E., to what distance westward will they run before they are absorbed or evaporated in the sandy interior deserts? If we are to reason after the analogies of all other parts of this continent, it is only (using a nautical term) by “hugging” this chain that a successful march can be accomplished. Arguing, therefore, from the data before them, some shrewd practical geographers, including Mr. Arrowsmith, differ from Sir Thomas Mitchell and the Committee of Sydney, and give a preference to an advance from the well provided settlement of Moreton Bay, from whence by obliquely traversing the adjacent cordillera, the expedition would at once be 3° of latitude to the N. of Fort Bourke, and consequently so much nearer their ultimate point of destination, the mouth of Albert’s

River, in the Gulf of Carpentaria. Other persons, and among them I may mention Capt. Owen Stanley, as well as his friend Capt. Stokes, are of opinion that separate expeditions should be sent across the cordillera from different parts of the coast, whereby the nature of the intervening tract on the western slopes of the chain could be made known before so long an interior march was hazarded. Others again may say, with our member, Mr. Gowen, that a thorough exploration of the interior of Australia will never be effected until we import thither camels from our eastern possessions, and thus at once get rid of the vast difficulties attending the want of water.

All these points are doubtless well worthy of consideration; but if I venture to express my own opinion, I should say that the best practical and geographical results will follow from the researches of an expedition purposely fitted out simultaneously to explore the cordillera itself, by land and by sea, from the point to which the researches of Conyngham have carried us to Torres Straits. Already, through the labours of that individual and M. de Strzelecki, half the cordillera is known and mapped, why then not complete the land survey? If the chain (and its western flanks to a certain distance only inland) be adhered to, no want of water can be experienced, and if the Government should determine to order a surveying vessel to coast along and supply the party at stated intervals with provisions, and also co-operate with it in making scientific observations, every object of the geographer would be obtained, whilst the practicability of a route along the western side of the chain would be completely set at rest. Such a survey at all events seems to me to be absolutely essential before any party is launched from Fort Bourke into the interior, which we have so much reason to apprehend is a complete desert. Whatever plan may be ultimately adopted, let us hope that in her effort to connect her distant settlements upon that continent, Great Britain may have the honour of solving a great geographical problem, and of ascertaining whether Australia be the only region of the same size upon the surface of the globe which offers the singular configuration which has been attributed to it, of having nearly all its rivers absorbed during their course.

From this general and speculative view of Australia, we have now to turn to some of the recent advances which have been made in extending our colonies, or in acquiring fresh knowledge of the country. Capt. H. Hamilton has lately communicated to us a paper on a part of the country lying between Liverpool Plains and Moreton Bay, which, together with an accompanying sketch map, furnishes us with some remarkable details on the geography of a district yet imperfectly known, but which,

from its natural advantages, promises ere long to become a very important addition to the colony of New South Wales. On the other hand, Capt. Sturt, by a correct survey of the course of the Hume River, and of the hilly districts extending to the junction with the Murrumbidgee, has distinctly made known the valueless character of many large tracts which, having been now laid down upon a map, may be avoided by all those who are searching for appropriate sites of new settlements.

PERSIA.—I have great pleasure in announcing a very interesting and important exploration in the southern part of Persia, by Lieut. W. B. Selby. This very energetic officer has succeeded in ascending, with his steamer, the river Karún as far as Shuster. But I cannot perhaps do better than copy verbally into this Address the account of Lieut. Selby's proceedings, as given in the *Bombay Times* of last December:—

“During the absence of Lieut. Campbell, the Euphrates and Assyria steamers were confided to the care of Lieut. W. B. Selby. This enterprising officer, instead of confining himself to ‘a regular communication’ between Baghdad and Basrah, explored the river Karún, the river of Dizful, the Keskbah, the Hie, and the Bámsheer. He ascended the Karún to Shuster, both by the main body of the river and by Abi Gargar, or artificial canal. He fully established the practicability of the navigation of the Bámsheer; and proved the possibility of communicating by steam between the Euphrates and Tigris by the Hie.

“These are by far the most important results of the Euphrates expedition; and should a steam communication be hereafter established on the rivers of Mesopotamia and Susiana, for commercial or other purposes (which we firmly believe will, before many years, be the case), the discoveries of Lieut. Selby will be duly appreciated. This officer, by his courage, his perseverance, and his scientific knowledge, was admirably calculated for an expedition of this nature. His valuable charts and reports will afford additional assistance in the illustration of the comparative geography of one of the most ancient, though least known, provinces of the Assyrian empire, Susiann. He has connected by scientific observations the course of the Eulauz, the Choaspes, the Coprates, and the Pasitigris, with the range of mountains forming the great chain running to the E. of Shuster, and with the rivers Euphrates and Tigris. He has proved the practicability of rivers, the course of which was hitherto almost unknown; and all his discoveries will confer important benefits upon British commerce.”

Such are the terms in which this important expedition is announced in the paper already named, and they are certainly such as Lieut.

Selby's successful effort eminently warrant. It may perhaps be remembered that the Karûn had already been ascended by Colonel Chesney as far as the bund at Awaz, an obstacle then deemed insurmountable. Lieut. Selby, however, found means to overcome it, and arrived triumphantly into the very heart of the country, to Shuster and up the Dizful. I shall only therefore add in this place, that I trust the Court of Directors of the East India Company, with their known liberality, will not only enable us, through the medium of our Journal, to give proper publicity to Lieut. Selby's memoir,* and his survey of the river, but also enable that enterprising and skilful officer to undertake an exploration of an unknown portion of Arabia, to which service he is desirous of devoting his best energies.

Hadramaut, and its swallowing sands.—A considerable tract of that part of Arabia, called Hadramaut, to which Dr. Forster has attached so much new interest in his ingenious solution of the Himyaritic inscriptions already alluded to, has been explored for the first time by Baron Adolph Wrede, whose account of his excursion from Aden has been communicated by Captain Haines, R.N.

Proceeding from Ossurum by Makalla to Wadi Doan, and traversing first a granite region with deep gorges and serrated peaks, and next a plateau 8000 feet above the sea, he reached, amid considerable difficulties, the town of Sava in the valley (Wadi) Rachia. It was at this place he heard of the desert El Aklaj, along the edge of which is the tract Bahr el Saffi, so called after a King Saffi, who, according to Arab tradition, was there, together with his whole army of Sabæans, swallowed up by the sands—a spot to which our traveller's Bedouin guides naturally conducted him unwillingly and with awe. Having gained the edge of the fatal spot, he cast upon it a plummet weighing half a kilogramme, which gradually sank till the cord (360 feet long) to which it was attached was run out, and thus he completely established the fact, that in these dry sands, which are composed of very fine and impalpable grains, any object of very moderate weight sinks to great depths. Hazarding no opinion of his own, and leaving the explanation to others, it is very much to be regretted that Baron Wrede has not given a sufficiently precise account of the physical features to enable us to reason upon the cause. Is the spot of swallowing sand higher than most of the adjacent country? Are the two "rocky blocks" of which he speaks as being close to it, points of rock "in situ" which communicate with other rocks beneath, amid which there are fissures? If these postulates

* Since this address was read, the Directors have transmitted to the Society a copy of Lieutenant Selby's narrative.

be granted, and he uses expressions which lead me to think they may, then I should have little difficulty in imagining how the impalpable sand, driven by the winds and accumulated in a mass in an upland cavity between projecting points of rock, should, upon a slight disturbance, run off into adjacent cavities. Indeed, we might conceive a whole tract of rocks of devious outline, and full of fissures, on the surface of which the sands were, by the force of the winds, constantly changing their position, and through the crevices of which they would be ready to escape from higher to lower levels upon the application of a small disturbing agent, just like the sand of an hour-glass. Such an explanation reduces the tomb of the Sabæan army to a simple natural phenomenon; but if, from the nature of the ground, this view be inadmissible, is it possible to conceive that these sands of Bahr el Saffi are in parts so very fine and impalpable that they offer no greater resistance than water?

Let us trust that the Baron will favour us with some more precise details, before he calls upon us to attempt the solution of so difficult a problem; and in the meantime, we may thank him for having drawn our notice to this very curious spot, in a country which will now doubtless be visited by many travellers bent upon the development of the Himyaritic inscriptions with which it abounds. Already an able and enterprising young clergyman, the Rev. J. Brockman, incited by the work of his friend Dr. Forster, is on the point of exploring Hadramaut.

INDIA.—*Bombay*.—In India there have been made some valuable accessions to our knowledge of the country—a natural result of the late military operations in that part of the world. The papers, however, which have been drawn up by the officers of the Indian army, are consigned in the Journal of the Bombay Geographical Society, who, we are informed, have put that publication into a better state, have brought up its arrears, and indexed its contents. We have for some time been promised the set complete, and are anxiously expecting its arrival.

Land and Maritime Surveys.—The seventh Volume of the General Report of the Trigonometrical Survey of India, containing the computations of the measurement of the meridional arc, has been sent home. Volumes VIII. and IX. of the Operations to the East of the Arc are completed, and may be daily expected; the triangulation has been extended over Rohilcund, and very nearly the whole of the Dooab. Surveying parties are occupied on new meridians east of these tracts.

During the past year new editions of sheets 76 and 77 of the Indian Atlas, containing the survey of Nillore, also of sheet 80, containing portions of the districts of Trichinopoly and Madura, have been published; sheet 79, containing the Salem district, and the remainder of Trichino-

poly; sheet 55, containing the districts of Nandaw, Beder Daroor, &c.; and sheet 107, containing Ganjam, Goomsoor, &c., are in the hands of the engraver, and will be published shortly. Several other sheets, being in continuation of those already executed in Northern India, are in hand, and will proceed without further delay.

With respect to the marine surveys by the officers of the Indian Navy, the harbours of Soonmecnana, by Lieutenant Montrion, and of Kurachee, by Captain Carless; also the coast of Africa, from the Straits of Bab el Mandeb to Berburra, by Lieutenant Barker, have lately been published. The Gulf of Manar, with the coast of India from Cape Comorin to Point Colymere, has been surveyed by Mr. Franklin, R.N., and will be published in the course of the present year.

Hong Kong.—Mr. A. R. Johnston has given us a very clear account of the physical features, population, productions, and climate of the little island of Hong Kong, now so important a British station. Composed of granite rock, which varies in height from 500 to 1744 feet above the sea, and supplied with abundant springs, it would be difficult to imagine "*à priori*" a more healthful position in such a latitude. But such has not proved to be the case: intermittent and remittent fevers, as well as dysenteries, having been prevalent.

AFRICA.

Tripoli.—A short account of Tripoli from our Consul, Colonel Warrington, who has for so many years resided there, though not remarkable in conveying new geographical facts or statistical knowledge, is useful in making us better acquainted with the climate and nature of the country. It also possesses considerable interest for the politician and moralist, in explaining to how great a degree British influence is extending into the interior of Africa, and how, by encouraging legitimate traffic and barter with the natives through such ports as Tripoli, we are more likely to succeed in annihilating the slave trade than by any array of fleets, or hostile embargoes.

EGYPT.—Canal of Suez.—The project of a canal communication between the Mediterranean and the Red Sea, ably discussed as far back as 1825 by Mr. Maclaren,* and more recently by an anonymous writer in 1836,† has been again brought to our notice by an excellent pamphlet on the subject by Captain Vetch, of the Royal Engineers, a gentleman whose opinion must have great weight. It is not my intention to go

* Edinburgh Phil. Journal, 1825, p. 294.

† For. Quart. Rev., 1836, p. 302.

into the history of the canal which existed formerly, nor to discuss the merits of the various lines now proposed, for these are questions of engineering science collateral only to our objects; but I mention the subject, because any undertaking by which travellers can more readily arrive at distant regions is interesting to us as geographers, and highly serviceable to the progress of civilization.

On this subject a memoir has been published by M. Aubert Roche, in the '*Revue de l'Orient*,' in which he states it as his opinion that the canalization of the Isthmus of Suez is "one of the most important questions which can agitate Europe."

I may here observe that Captain Vetch's geological knowledge, and his acquaintance with the nature of ancient sea beaches, give weight to his suggestion, that at no very distant period, certainly in the most recent geological epoch, Asia must have been separated from Africa by an arm of the sea which covered all the lower parts of the Isthmus of Suez. Looking to the very small amount of elevation of the land to the E. and W., he successfully repudiates the proposal of merely letting in the waters of the Red Sea (which stand at a higher level than those of the Mediterranean) upon the intervening ground, by which an uncontrollable mass of shallow water, useless for any commercial end, would destroy valuable tracts of ground, and in the absence of all hard rocks on its sides would communicate with the mouth of the Nile. His own project of a straight line of canal from Suez to Tineh, seems indeed to me to be infinitely preferable to those lines further to the W., by which the ancient canal and the lakes of Baka and Themsal should be made available. The waters of the Red Sea being 29 feet higher than those of the Mediterranean, it does appear rational that a straight canal, with well-confined banks, would be effectually cleaned and scoured by a steady current always flowing from Suez to Tineh. Whether it may be worth while to employ the energies of Britain in executing such a work, is a distinct question, handled by Captain Vetch with much candour; but, if undertaken, it is probable that it would be attended with fewer obstacles than the scheme of uniting the Pacific and Atlantic.

Sir Gardiner Wilkinson, whose long and able researches have cast so bright a light on ancient Egypt, has lately published another work, entitled '*Modern Egypt and Thebes*,' in two volumes, which will be found highly useful to all travellers into a country the cradle of all learning and science.

We have also to acknowledge the services rendered by Sir Gardiner to the interesting subject of Egyptian topography, in the notice he has sent home of his having finally settled the question of the site of the city of

Sais in the Delta, by the discovery of a hieroglyphic inscription amongst the ruins of Sea-el-Hajar, bearing the name of Neith, the lady of Ssa.

Lake Moëris.—Among the most important discoveries effected of late years in Egypt, must be mentioned the site of the celebrated Lake Moëris, by Mons. Linant de Bellefond, Chief Engineer to Mehemet Ali. This large artificial reservoir, described by Herodotus as having a circuit of 3600 stadia, or about 360 geographical miles, and 300 feet deep, with two pyramids in the midst of it, and connected with the Nile by a canal, was destined to receive the superabundant water of the river during the annual inundations, and to let it off for the irrigation of the lower lands. The exact site of so stupendous a work was hitherto unknown, no one of the explorers who have examined the country having satisfactorily determined it. This may probably be attributed to the fact, that the Berket Keirân has generally been regarded as the remnant of Lake Moëris. This, however, M. Linant has proved, by considerations into which I cannot go in this place, could not possibly be the fact; and that author, who had previously come to the conclusion that the site of Lake Moëris must be sought in the higher part of the Fayûm, has had the satisfaction, by a special examination of the territory, of finding his conjecture perfectly confirmed. He, however, ascertained its extent to be only 150 square miles, an immense area it must be confessed for an artificial lake, though greatly inferior to the dimensions given to it by Herodotus. The bed of the lake is considerably raised, as might indeed have been anticipated, by deposition from the muddy waters of the Nile; and it is probably this circumstance which has prevented its site from being sooner discovered. M. Linant is of opinion that the lake, with all its advantages, might be restored at a comparatively small expense.

ABYSSINIA.—Various political circumstances and international arrangements—among which may be particularly mentioned the British settlement at Aden, the political mission from thence to the kingdom of Shoa, and the steam navigation of the Red Sea—have recently conferred an increased degree of importance upon Abyssinia, not only in our own eyes, but also in those of other European powers. Visited by Bruce in 1769, in order to discover the source of the Nile, then by Lord Valentia and Salt in 1805, and subsequently, in 1810, by Salt alone, as Envoy of the British Government, it has since attracted the attention of many travellers.

Lord Valentia left behind him Pearce and Coffin. The former, after remaining many years in Northern Abyssinia, returned to Egypt, where he died. A narrative of the life and adventures of Nathaniel Pearce

was published in 1819. Coffin, we understand, is in Tigré to this day; he has completely adopted the native customs, and is a petty governor in Agame.

A country professing Christianity, but in which the pure doctrine of the Christian faith, and the moral habits which result from a right understanding of the Gospel, have been wholly forgotten,—a country, moreover, where, together with the nominal Christians, are mixed up a multitude of Mohammedans and Pagans, and where men are bought and sold like inanimate objects of merchandise, opened a fine field for missionary labours; and, accordingly, the Rev. Samuel Gobat and the Rev. Christian Kugler were dispatched by the Church Missionary Society. They landed at Massowah in December, 1829. Mr. Kugler died in Tigré in December, 1830, but his place was supplied by the Rev. Charles William Isenberg, who reached Adowa in April, 1835. He, again, was followed by the Rev. Charles Henry Blumhardt, in the beginning of 1837, and by the Rev. John Lewis Krapf at the close of the same year.

In the beginning of 1830 Mr. Gobat proceeded to Gondar, being the first European who has visited that capital since Bruce. He returned to Europe in 1833, and the result of his residence in Abyssinia was published in 1834, in a volume entitled *Journal of a Three Years' Residence in Abyssinia.* In the following year he went back to Tigré, but in 1836 he was compelled to quit the mission from ill health. Messrs. Isenberg, Krapf, and Blumhardt remained at Adowa till the beginning of 1838, when, in consequence of the obstacles thrown in their way by the native priesthood, they were obliged to leave Abyssinia. The subsequent labours of the missionaries in Southern Abyssinia will be mentioned in the sequel; for the present, I will continue the list of travellers who have entered the country by Massowa.

In September, 1831, Dr. Edward Rüppell, a German naturalist of distinction, arrived at Massowa. He went by Atejerat and Takir-akkira to Gondar, and thence southward, as far as the bridge over the Abaï; and left Massowa, on his return to Europe, in the beginning of July, 1833.

M. Rüppel, who made two journeys into Abyssinia, was no ordinary traveller; for he brought to Europe a vast collection of animals, including many new species, which, having deposited in the public museum of his native city, Frankfort S. M., he described in a splendid work, which has thrown great light upon the natural productions of Nubia as well as of Abyssinia. It was in consequence of these well-matured results that, in the year 1838, five years after his return, the Royal Geographical Society awarded to him one of its gold medals.

Dr. Rüppell's jüger, named Martin Bretzka, was sent back to Abyssinia in 1835, and penetrated to Shoa about the same time as the French travellers next to be mentioned. He remained in various parts of Abyssinia for some years, collecting specimens in natural history.

Messrs. Combes and Tamisier, two French gentlemen, arrived at Massowa in April, 1835. They passed by Gondar, and through the country of the Wollo Gallas to Shoa, remained there for a short time, and then returned, going westward across the Abaï a short distance into Gojam, and then northward through Begemidir and Tigré. Their journey through Abyssinia occupied from April, 1835, to June, 1836. It might and ought to have afforded splendid additions to geography, as they were the first Europeans, since the time of the Portuguese, who had visited the greater portion of the districts through which they passed. As it is however, from the style in which their travels (in four volumes) are written, and from the fact that their route is merely adapted to Salt's map of Abyssinia, instead of serving, as it should have done, to the correction of its many imperfections, they have not obtained the credit they are entitled to for what they have really effected; and it was for a time doubted whether the southern portion of their journey was not altogether apocryphal. A late traveller, Dr. Beke, has it, however, in his power to prove their having actually been both in Shoa and in Gojam. Mr. Combes was at Zeffah and Tajurrah towards the end of 1840, with the intention of penetrating to Shoa; but he was not permitted by the Somali and Danakil tribes to pass through.

The Baron von Kalte, a German, next reached Massowa, with the professed intention of penetrating south-westward into the countries beyond Abyssinia. In Hamazen, however, he was plundered of all he possessed, and reached Adowa with some difficulty, from whence, after a short stay there, he returned to the coast. He published a small work in German, under the title of 'Travels in Abyssinia in the Years 1836 and 1837;' but his whole stay in the country extended only over about three months at the end of the former year.

Two other Germans next appear as travellers in the same country, Dr. Schimper and Lieutenant Kielmaier. The precise dates of their arrival in Abyssinia cannot be stated; but it appears they were both in Adowa in the beginning of 1838, and were included in the decree of expulsion promulgated against the Church Missionaries. M. Kielmaier, who had, apparently, only recently arrived, quitted the country with the missionaries. Dr. Schimper, on the contrary, who must have arrived there at an earlier date, and have made friends in the country, remained there without molestation, and has in fact continued there

ever since, with the intention, as expressed by him, of ending his days in Abyssinia, he having, only last year, married an Abyssinian wife, according to the rites of the Church of Rome, of which he has lately become a member. This worthy and most amiable man is a native of Esslingen in Wirtemberg, who went to Abyssinia to collect specimens in natural history, principally botanical, for a society in his native town, and the collections he has made during a residence of several years in Tigré and Samen have probably exhausted the flora of Northern Abyssinia. He now talks of proceeding towards the south. His modest and retiring nature has prevented him from placing himself before the world, and thus becoming known as he deserves to be. During the last year, however, some very valuable and interesting communications from him to his society were published in the *Allgemeine Zeitung*, and have attracted much attention in Germany.

The return of Messrs. Combes and Tamisier to France appears to have turned the attention of their countrymen especially to Abyssinia, and since their time several other French travellers have visited almost every portion of the country. The first were Messrs. Dufey and Aubert, whose object in Abyssinia was to ascertain the mercantile capabilities of the country. They arrived at Massowa in June, 1837, and went together as far as Adowa, from whence Mr. Aubert returned, whilst Mr. Dufey went on to Shoa; from the latter place he returned, in August, 1838, to the coast, by a road previously untrod, across the country of Adel, reaching Tajurrah in the November following. Mr. Dufey subsequently died at Lobeio.

The brothers D'Abaddie, Antoine, and Arnault, arrived in Tigré in the year 1838, and proceeded to Gondar. Arnault thence went on to Gojam, where he remained for some time, and accompanied the prince of that country on a warlike expedition into the Galla districts of Kuthai and Liban, to the south of the Abaï. The elder brother returned to Europe for a short time, and, in 1840, again went to Abyssinia. No detailed account can be given of the operations in that country of the two D'Abaddies, who have both been moving about in various parts; but at the beginning of last year the younger was in Gojam, whither the elder was proceeding to join him. It is said that they contemplated going to Shoa. The elder brother has made numerous communications to the scientific world; by the latter, it does not appear that anything has yet been made public.

In June, 1839, Messrs. Lefevre, Dillon, and Petit (the first of whom previously made a short visit to Tigré) arrived at Massowah, professedly on a scientific expedition. Their movements are not very clearly to be traced. They arrived in Shoa in February or March,

1843; accompanied the king on one of his usual expeditions to the frontiers of Gurague and Enarea; returned thence to Ankober, and, in May, left the latter place for Duna in Gojam, by the route previously taken by Dr. Beke in 1841. From Duna they proceeded by Debra Weik and Mota to the broken bridge, where, in crossing the Abaï, Mr. Petit was unfortunately drowned. From thence Mr. Lefevre went to Gondar, and thence to Adowa, which place he left in July for Massowa and Egypt, where he arrived in October last. Mr. Dillon is since dead.

Messrs. Ferret and Galinier, two officers of engineers, were employed by the French government in surveying the whole of northern Abyssinia, from Hamazen to Gondar. The result of their labours has not hitherto been made public; but it can scarcely be doubted that it will be a work of great importance.

M. Vignaud, a student of the French *École des Mines*, was in the country about the same time. He died at Jidda, on his way from Abyssinia, in last year.

About the time that these last-mentioned French travellers visited Abyssinia, the French government appointed a consular agent to reside at Massowa, and towards the end of 1842, M. de Goutin, the agent in question, visited Gondar, by direction of his government, in order to ascertain the advantages of opening a trade with that place.

Among the steps taken by the French government to connect Abyssinia with Europe, we must not forget to mention the important measure adopted by the Propagandists, for the union of that country with the See of Rome, viz., the establishment of a Roman Catholic mission to Adowa. As far back as 1838, a priest of that church, named the Padre Giuseppe Sapeto, entered Tigré, in company with the Messrs. D'Abaddie, the elder of whom, on his return to Europe, took with him a young Abyssinian priest to be educated in the College de Propaganda Fide at Rome. In 1841, Padre Sapeto having been recalled, Padre de Jacobis, a Neapolitan priest of the congregation of St. Francis de Paula, a man of great talent, was sent to Adowa, with the title of Apostolic Prefect in Abyssinia. He was accompanied by Padre Biancheri, a Genoese priest of the same congregation, the young Abyssinian priest already mentioned as having been educated at Rome, and an Italian lay-brother. Such is the present Roman Catholic mission in Abyssinia; and its establishment in that country, if the conduct of its members continues to be marked with the same talent and caution that have hitherto characterised their operations, is likely to be attended with results most important to the advance of civilization.

The government of Belgium likewise, with a view to ascertain the

opening which Abyssinia may afford for the manufactures of their country, dispatched thither M. Blondeel von Koelmbroeck, the Belgian consul-general in Egypt. This gentleman, who reached Massowa in 1839, went on as far as Gojam, from whence he returned to Egypt, by the way of Kuara and Sennar, in 1842.

Mr. Bell, a young officer of the Indian Navy, has also visited Abyssinia. He entered by the north, and proceeded southward towards Gojam. On his road, near Lake Fzana, he was attacked and severely wounded; and it was for a long time believed that he had died in consequence. But having recovered, he proceeded to Gojam, from whence he returned to Egypt in 1841. In May, 1843, he was a second time at Massowa, accompanied by a Mr. Plowden; and their intention was stated to be to attempt to penetrate southward to Enarea.

Mr. Parkyns reached Massowa shortly after Messrs. Bell and Plowden, with the intention of joining them. It is reported that Mr. Bell is again in Egypt, but nothing is said about Messrs. Plowden and Parkyns.

To the foregoing list has yet to be added a M. Even, a Frenchman, who entered Abyssinia by Massowa in 1841, and penetrated to Shoa, through Lasta (where he was robbed by the Prince of Wang), and the country of the Wollo Gallas. He remained at Ankober only a few days, and then returned northward: he is since dead.

These are, we believe, all the Europeans who have entered Abyssinia from the N. I shall now say a word of those who went into the country by the S.

The two church missionaries, Messrs. Isenberg and Krapf, after their expulsion from Tigré, decided on attempting to penetrate to Shoa across the country of Adel, a road till then unfrequented, as, at the time they set out for that purpose, M. Dufey had not yet traversed the country. They arrived at Tajurrah in April, 1839, five months after the French traveller had reached that place in safety, and proceeded westward to Shoa, where they arrived at the end of May. They were together till the following November, when Mr. Isenberg returned by Tajurrah to England. Mr. Krapf remained in Shoa till March, 1842, when he left it with the intention of proceeding to Egypt by way of Gondar and Massowa. He had already made considerable progress towards the former place, when he was stopped by hostilities in that part of the country, and he was obliged to retrace his steps to Gatira, the residence of a Galla chieftain, named Odara Bille (dependent on, or in close alliance with, the King of Shoa), by whom he was robbed of all he possessed. His despoiler not allowing him to take any other route, Mr. Krapf

now turned towards Massowa by another new road, passing through Arégot, a fertile province of Central Abyssinia, principally in the possession of Galla tribes. He reached Massowa in May, 1842. Whilst Mr. Krapf was alone in Shoa, he accompanied the king on several expeditions into the Galla districts to the S. and W., respecting which he collected much valuable information; as he likewise did (from hearsay) of the countries lying yet further in the interior in those directions. His account of these latter countries is contained in the '*Monats Berichte*' of the Berlin Geographical Society; and the Church Missionary Society has recently published an interesting volume of the '*Journals of the Rev. Messrs. Isenberg and Krapf.*'

Towards the end of 1842 Mr. Krapf, accompanied by Messrs. Isenberg and Muhleisen (the latter of whom had some time previously attempted to pass by the way of Tajurrah, but in vain), left Egypt with the intention of returning to Shoa. They reached Tajurrah on the 20th of December, 1842. But in consequence of orders from the King of Shoa to the Daukali tribes, they were not permitted to go forward. This event is greatly to be deplored, as, in consequence of it, and of Messrs. Isenberg and Muhleisen having been refused admittance into Tigré on their attempting to return thither in April, 1843, the British Church Mission in Abyssinia, which had existed since 1829, has been abandoned. Mr. Muhleisen has accordingly been transferred to the western coast of Africa. Mr. Krapf has gone to Brawa, in the hope of being able to penetrate from thence into the interior; and Mr. Isenberg remains for a while at Bombay, intending to join Mr. Krapf should there appear a prospect of success in the proposed direction.

After Messrs. Isenberg and Krapf, mention may be made of M. Rochet, who reached Shoa by the same route of Tajurrah, arriving there at the end of September, 1839. He remained in the country till March, 1840, when he returned by the way of Tajurrah to France, where, in 1841, he published his '*Voyage dans le Royaume de Shoa.*' On leaving Shoa he brought with him various presents for the King of the French; and in 1842 he returned to that country, taking with him return presents. He arrived in Shoa in 1842; and at the departure of the British Mission from that country in the February following, he was still there.

The two travellers who followed immediately after M. Rochet, both died unfortunately before reaching Shoa. The first was Mr. Airston, an English gentleman, who proposed to pass through Shoa to Gondar, and thence return to Egypt by Sennar; he died, however at Ferri, the frontier town of Esat, in March, 1840.

Lieut. Kielmaier, who has already been mentioned as having been expelled from Tigré in 1838, went soon after Mr. Airston; but he had not reached more than half way, when he died at Wady Amailé, near Killela, in April, 1840. These two travellers are not to be regarded as altogether the victims of a malignant climate, since the country between the coast and Shoa is far from being of an unhealthy character, as is indeed evinced by the numerous Europeans who have traversed it in perfect health and safety. Mr. Kielmaier was already in very bad health when he arrived at Tajurrah; and, having performed on foot the greater part of the journey to the place of his death, his strength was not sufficient to support the fatigue. Mr. Airston is stated by M. Rochet, who met him at Ferri, as having had an affection of the brain; and although M. Rochet rendered him every assistance in his power, he was compelled to leave him before he expired.

Dr. Beke was the next traveller: he arrived at Tajurrah on the 15th November, 1840; and in Shoa on the 5th February following: there he remained till October, when he went westward into Gójam. In that country he remained till February, 1843, when he returned by the way of Begemider, Lasta, and Tigré, reaching Massawa in the beginning of May last.

Major Harris's Mission.—In consequence of proposals of friendship made by Sahela Selassie, King of Shoa, to the government of India, the political mission to which I have alluded in the commencement of this subject, was dispatched to Shoa in the beginning of 1841, under the charge of Captain (now Major) Harris. He arrived in Shoa at the end of July, 1841, and remained there till the beginning of February, 1843.

Though a treaty of amity was entered into with the king, the articles of which are detailed in the work published by the gallant leader of the expedition, entitled the 'Highlands of Ethiopia,' it may reasonably be doubted whether a safe transit can yet be established between the Red Sea and the western frontier of Shoa, the distance being between 300 and 400 miles, and the intervening tract of difficult and rugged nature being occupied by lawless people.

Of this work of Major Harris* and his assistants, I may say that it familiarizes the general reader with the manners, customs, religion, and statistics of a people who claim to be the descendants of Solomon and the Queen of Sheba. From it we also learn, as well as from the memoirs of Dr. Beke, that large tracts of this region, particularly those lying to the W. of the Hawash river, are of volcanic origin; thus seeming to explain the probable cause of the great elevation of the

* Sir W. C. Harris since the Address was read.

plateau in which is situated the capital of Shoa. Though the language of his work is cast too much in the oriental style to accord with the taste of men of science, Major Harris has unquestionably the merit of having been the first to lay down precisely the longitude of Ankober, and thus to give a base from whence other geographers might extend their observations. He has also contributed various elements of positive knowledge concerning a country of whose interior we have hitherto been very ignorant. The contributions to natural history by Dr. Roth, naturalist of the expedition, are recorded in the Appendix.

The last traveller we have to mention is Mr. Charles Johnston,* who went up to Shoa in 1841 and 1842. He remained there till the departure of the mission of Major Harris, and accompanied it down to the coast. In his journey up the country he determined the latitude and longitude of Lake Abhibdad, and in a memoir recently read before this Society, he has speculated upon the manner in which its waters, constantly fed by the Hawash and, as he thinks, some southern streams, having no communication with the adjacent sea, are kept at a given level.

Thus no less than forty-two European travellers have visited Abyssinia within the last forty years.

Of all Abyssinian travellers since the days of Bruce, Dr. Beke, as an individual, having most improved our geographical acquaintance with that country, I may be permitted to say a few words explanatory of his labours, since they have not yet been presented to the public in a continuous work, and are known to us through documents confided to ourselves. He landed at Tajurrah in November, 1840, and left Massowa in May, 1843, having been exactly two years and a half in Abyssinia and the lowlands adjoining it. Krapf and others have gone over more ground.

In his arduous endeavours to construct a map of a large tract, Dr. Beke carried a series of thermometric levels across nearly seven degrees of longitude (from Tajurrah to Bauja), having been the first to ascertain the remarkable depression of the salt Lake Assal, which he roughly estimated at 760 feet (since ascertained by Lieut. Christopher to be 590) below the level of the sea: and he has fixed by astronomical observations the latitude of upwards of seventy stations.

Whilst in Shoa he visited and roughly mapped the watershed between the Nile and the Hawash, along a line of nearly fifty miles northward of Ankober, and he obtained information of the existence of the river Gojeb.

* Mr. C. Johnston has published his travels since this address was read.

After leaving Shoa, he proceeded westward across the Abaï, into the plateau of Gojam, where he remained, in all, a year and a quarter, so traversing it in various directions as to be able to construct a sketch map of the country.

He is the first traveller since the time of Bruce who has described the sources of the Abaï (the Nile of Bruce); (Mr. Arnault and Mr. Bell were both there before Dr. Beke, but have given no account of their visits;) and I rejoice to say, that he completely sustains the accuracy of the narrative of the great explorer of Abyssinia. By reaching the river Abaï at various points around Gojam and Damet, he has determined its course approximatively; and it may be mentioned that near Mota he discovered a second bridge over that stream, described by no previous traveller.

During a long stay in the neighbourhood of Baso, in the hope of being able to penetrate from thence southward, he collected information respecting the countries to the south of the Abaï, from which he has constructed a rough map comprising near 70,000 square miles of country, hitherto very partially explored by one of the brothers Abaddie, and as yet, of course, very imperfectly laid down.

On his way from Gojam to Massowa, Dr. Beke took a hitherto untrodden road; passing by Makkedera Mariam, Debra Trabor, Ebenat, and Sokota to Autálo; and from thence again by a route never travelled by other Europeans, round by Takirákirá (a place described by Rüppell) to Adowa. On this route he crossed the Takazi much higher up to the south than others had done, by which the course of that river in the maps is corrected; whilst by this *new* line, through the heart of Abyssinia, an important addition is made to the general map of that country. Dr. Beke's maps and journals have been handed over to the Royal Geographical Society, and a small portion of them has already been published in our Journal. Various other portions of the information obtained by him have appeared in the 'Friend of Africa,' published by the 'African Civilization Society;' but the greater mass, comprising a description of the manners and customs of the inhabitants, as well as his personal adventures, he is, I understand, now engaged in preparing for the press.

It may be added that he has collected vocabularies of thirteen languages and dialects spoken in Abyssinia, and the countries to the south, and he has made numerous drawings illustrative of the country and its inhabitants.

Thus upon the whole, although, for want of instruments and other means, Dr. Beke has not been able to construct a map of the country he

has visited with that degree of accuracy which numerous astronomical observations for longitude as well as latitude can alone ensure; it does appear that with very slight assistance from the Royal Geographical Society of England, and without receiving the slightest aid from Government, he has by his own efforts alone performed the duties of a zealous and inquiring geographer, and has made us much better acquainted than we were previously with the interior of Abyssinia—a country which is daily exciting fresh interest, and to which other European nations have sent as many travellers as ourselves.

As a proof, indeed, that this region, on which I have dwelt so long, is not neglected by geographers on the continent, I may refer you to the map recently published by M. Carl Zimmermann (Pyritz, 1843), on which are laid down, not only Abyssinia with the routes of the long list of travellers previously cited, but also vast adjacent tracts of Eastern and Middle Africa, from 1° S. of the Equator, to 16° S. lat., and from Cape Guardafui on the E., to 22° long. E. of Paris on the W. Though doubtless loaded with imperfections, this map is useful as a *résumé* of our present knowledge.

CENTRAL, SOUTH-EASTERN, AND SOUTHERN AFRICA.—The immense tract lying S. and S.E. of Abyssinia—extending on the N. from Zeila to Cape Guardafui; bounded on the E. by the Indian Ocean, from Cape Guardafui to the mouth of the Jub, or Juba, at the equator; and reaching thence to the S.W. angle of Abyssinia—is still nearly a geographical blank. Of this vast region, inhabited by Galla and Somanli tribes, we have nothing but vague accounts; and though it may be rich in productions which, advantageously for the natives and ourselves, we might exchange with the objects of our industry, and though situated in the vicinity of our Eastern territories, it is still all but a *terra incognita*. It would appear that rumours of the ferocity of some of the tribes have hitherto prevented our most daring explorers from penetrating these countries, though it is equally certain that, in some parts, their natives are a mild and hospitable race: such, more especially, are those described by Lieut. Christopher as living in a state approximating to that of the golden age. These people inhabit the lower course of a large river now known to us as Haines's River, a stream of great magnitude, and therefore possibly having its source somewhere in the mountains which form the southern boundary of the basin of the Hawash. Opinions, however, vary very much regarding this river. By one traveller it is supposed to be a branch of the Jub; but the examination of conflicting statements, based upon reports or hypotheses, does not become the President of this Society. We must therefore content our-

selves, for the present, with ascertained facts. Whatever, then, may be the case regarding the upper course of this river, Lieut. Christopher has shown that, in its lower course, it approaches to within about 10 miles of the sea, in lat. $1^{\circ} 40' N.$, and long. $44^{\circ} 35' E.$, at a place called Galwen, whence it runs parallel with the coast to Barava, a distance of 45 miles, and then diverging a little inland, finally empties itself into a lake having no known outlet. Between the river and the sea runs a range of sand-hills, about 200 feet high, through which it appears that much of the water reaches the sea by infiltration, as it is everywhere met with along the coast in this part, near the surface. On this fine river, grain is said to ripen all the year, and to yield from 80 to 150 fold: 1300 lbs. of *jowari* may be obtained for one dollar; and Lieut. Christopher is of opinion that, with proper cultivation, every luxury of the East might be there produced with facility.

Of the Jub, or Juba, we know nothing more than the mouth, with which, as mariners, we are necessarily conversant. From what we do know, however, it appears to be a large and navigable stream; and the natives on its banks, so far from entertaining any hostile feeling towards us, have invited our visits.

In a word, as I have already observed, we know little or nothing positive of the countries to the S. of Abyssinia; but there is every reason to hope that Mr. Krapf will be enabled to ascend the Jub from its mouth to its sources, and thus lay open to us the way into the interior, and clear up the many doubts that hang over these regions, and the water-courses by which they are intersected.

As concerns Southern Africa, properly so called, I cannot help regretting that, whether from the nature of the climate, the inhospitality of the natives, or from other causes, this region of the great continent (*i. e.* its interior) has been so little explored, though it is probable that our very learned associate, Mr. Cooley, from his extensive acquaintance with everything relating to Southern Africa, may be in possession of knowledge of which, in common with the mass of geographers, I am entirely ignorant. We have been told, indeed, that the late Mr. Canning, having been informed of the existence, in the archives of Lisbon, of certain documents relative to an habitual communication kept up by the Portuguese factories at Mozambique, and those at the Zaire, succeeded in obtaining translations of the same from Count Funchal, the then Portuguese ambassador to this country. Acting upon this information, Sir Robert Peel was applied to for a communication of this document, if it existed in the archives of the Foreign Office; and he immediately directed a search to be made in the various offices of the Government, but without

success. We have not been able to learn whether the supposed paper may not be in the possession of Mr. Canning's family. But surely, if the communication alluded to was formerly so practicable, we see no reason why the same route might not be again explored; and though we feel diffident, from motives of humanity, in recommending to travellers the perilous task of exploration in Africa, we may nevertheless, without violation of our conscience, say to those determined to travel in that country, that, as we have courts of adjudication by virtue of our treaties with Portugal, on the principal Portuguese settlements, on both the eastern and western coasts, and as we know that the Portuguese have pushed their explorations and influence far into the interior, the space which remains to be passed over, in order to connect the extreme colonies of the two coasts, is not so great that we may not hope to see the difficulty vanish before some enterprising traveller. Mr. Duncan, one of our countrymen, full of zeal and activity, though not professing to be very scientific, is indeed about to proceed to the west coast of Africa; and if, in his desire to explore the interior, he should select the line between Loando on the west and Mozambique on the east, and should accomplish his object, he will have the great distinction of being the first European who has made known the real nature of the axis of Southern Africa in so northern a parallel—our present acquaintance with it being confined to the coast, and a few hundred miles to the north of our own settlements at the Cape of Good Hope.

Whether Mr. Duncan may take the above route, or confine his explorations to the country of Koomessie and the Kong Mountains, east of Cape Coast, and to an excursion to the new settlement of Abbé Aceuta, inland from Baddagree, containing 30,000 souls, and where the missionary Crowther is now established, we are certain to reap some useful knowledge from his efforts. In alluding to Mr. Duncan, it must not be forgotten that he has already braved the dangers of the African climate, having been a volunteer on board the *Albert*, in the Niger expedition.

MISCELLANEA.

Physical Atlas of Berghaus.—It was justly observed by Mr. Greenough, in his last anniversary address to the Society in May, 1841, that "the only sound basis for geography in general is physical geography; all kinds of special geography being mere grafts upon the original stock." The truth of the observation must be so evident to all who consider the subject, as not to require that I should now enlarge upon it. Yet physical geography withal has never been studied, till of late years, as it deserves to be; and I am sorry to add that

it has made slower progress in our own than in almost any other country. It is, therefore, with peculiar satisfaction I am enabled to announce the publication of a work well calculated to call attention to the science of physical geography. Mr. Alexander Keith Johnston, of Edinburgh, during a tour of inspection to the several geographical and cartographic establishments of the continent, has made arrangements with M. Berghaus for the publication in English of that gentleman's 'Physical Atlas.' Of this valuable and most interesting work we have already seen a few sheets; they are larger than those published in Germany by M. Berghaus, and engraved and coloured in the most beautiful manner. The work will consist of thirty plates, each accompanied, on an average, by two pages of letter-press. The principal divisions of the subjects are Meteorology and Terrestrial Magnetism—Geology—Hydrography—Zoological Geography and Anthropology—and Phyto-Geography, or the distribution of plants. Each of these subjects will be again subdivided, so as to give a complete view of all the many important facts of physical geography. To the original maps of Professor Berghaus will also be added others by some of the most eminent philosophers of Edinburgh. On the whole Mr. Johnston's 'Physical Atlas' will not only be unique in this country, but most useful to the science we cultivate, and highly creditable to the zeal and enterprise of its spirited publisher.

Contour Maps, Relief Maps, and Models.—If a knowledge of the actual configuration of the surface of a country, with its multiform elevations and depressions, be essential to the study of physical geography, any means by which this configuration can be correctly represented must be of great value. On the most detailed topographical maps the heights and depressions can only be represented by lines which at best convey but inadequate ideas. The old mode of representing hills by etched lines of greater or less thickness, whether straight and single, or crossed and wavy, conveyed no distinct information as to the actual height of mountains and their absolute acclivity. Of late years, however, two systems have been introduced, that by contours and that of Lehman. Of the anaglyptic process, which is purely a mechanical process, I shall not speak. The method of representing the inequalities of the surface by lines of equal altitude was first suggested by Ph. Bouache and others (see *Mémoires de l'Académie des Sciences*, 1752, p. 399; 1753, p. 586; and 1756, p. 109), and again proposed by M. Dupain-Triel in 1784 (see *Carte intitulée 'Nouvelle Méthode pour exprimer sur les Cartes les Hauteurs,' &c., avec un Mémoire de M. Du Caila: Paris, 1784*); and again, 'Carte de la France, An 7 de la Rép.'

This method was introduced to public notice at the last meeting of the British Association, and was there generally approved. It has been very efficiently applied by Captain Larcom, R.E., to part of the Irish survey, and will, I doubt not, come into pretty general use. On these maps, as many of you must know, the hills, instead of being indicated by short strokes indicating the direction of the slopes, are shown by a number of continuous curves representing so many horizontal sections of the ground, at given and determined heights above each other. It is evident that the forms of these curves will vary according to the forms of the ground, which are thus brought before the spectator by these curved lines. These lines also point out at one and the same time the positive and relative heights of different places, and thus supply the most important data, both for the physical geographer, practical engineer, and geologist. The expense of merely contouring the maps after the levels have been taken, as in the case of the Ordnance Survey of Ireland, is found to be so trifling (less than a farthing per acre) as to lead us to hope that for the future all our topographical maps will be executed according to this excellent plan.

No one can call in doubt the importance of such a method of truly delineating natural outlines. In reference to geology, indeed, I must not omit this opportunity of stating that Sir Henry de la Beche brought the system into a very effective application to explain the structure of rocks, about two years ago, when he illustrated a mineral tract in South Wales belonging to the crown, which till then had been very little noticed. Applying different tints of colour to each contouring line, he showed how certain valuable beds were prolonged; how they contracted in one spot, and expanded in another; and he thus produced a picture of subterranean distribution, which is a document of high value to the crown.

It is needless to dilate on the national consideration to which the extension of this system is entitled, and we may hope to see all our richest mining countries similarly depicted. It is in fact the finishing stroke of geological labour, and proves, more effectively than volumes of writing, that without accurate details in physical geography the triumphs of geological anticipation can never be satisfactorily established.

The system of Lehman's, which with some modifications is pretty generally adopted in Germany, Russia, and Austria, consists in the adoption of a proportion between the thickness of the black lines and the white space left between them, which proportion is regulated by a scale, the first division of which, appropriated to slopes of 5° , has eleven times as much white paper left between the lines as the lines themselves are

thick; the next division is for 10° , in which the white is to the black as 10 to 2; the third division 9 to 3; and so on till we come to slopes of 30° , in which the proportion of black and white is as 6 to 6; beyond this the white spaces go on diminishing in width, while the thickness of the black lines increase, till for a slope of 60° the black is to the white as 11 to 1. This in theory is simple and ingenious, and a map engraved on this principle is not only beautiful in appearance, but, if correctly executed, affords, like the contour system, the means of obtaining a profile of the ground. Unfortunately, however, it is liable to many sources of error in practice, and therefore, generally speaking, approximates to real height and slope very little more than the old arbitrary method. The contour system seems to be the only one by which the real elevations and undulations of the ground can be represented on a flat surface. But even here an effort of the mind is necessary; the elements of a relief are there, but no relief is immediately pictured to the eye. Any doubt which may arise whether a contour represent an elevation or a depression is effectually cleared away by Captain Vetch's method of etching that side of the line on which the ground falls.

To obviate this last-mentioned defect, relief-maps have been invented: the first, I believe, appeared in Germany, and reference has been made in the addresses of my predecessors in this chair to maps of this kind.

In our own country Messrs. Dobbs and Co. have taken up the subject, and have given a very instructive small map of England and Wales geologically coloured. But although this and other very creditable productions by skilful artists have already appeared, the most beautiful map of the kind is unquestionably that just now completed—the Peninsula of Mount Sinai. Next to this will appear a Relief Map of Syria, for the correct execution of which the Board of Ordnance have very liberally allowed Messrs. Dobbs the use of Lieutenant Symonds's MS. maps and levels of part of that country, for which that distinguished officer was rewarded with one of the gold medals of this Society.

Whilst these relief maps, it cannot be denied, give a lively impression of the inequalities of the surface of the ground, some persons have contended that there is an inconvenience inseparable from them when employed in the instruction of youth, who might thereby be misled as to the real amount of elevations on the surface of the planet. But this objection seems to me to have little weight; since every good teacher would doubtless instruct his pupils that the elevations are necessarily over-magnified, in order to render them perceptible to the eye. He might indeed, without under-rating the value of a relief map, refer them to the caution of Sir John Herschel, who has justly observed, that the very

thickness of the paper with which an 18-inch globe is covered bears a greater proportion to the diameter of such a globe than the height of the Himalaya does to the earth.

The representation, therefore, in relief, of the mountains of our earth on an artificial globe, such as that by Mr. Kummer of Berlin, which was lately exhibited to the society, renders it necessary to magnify those heights beyond all natural proportion; and to a certain extent it is the same with relief maps of particular countries. Moreover, as no heights below a certain amount can be inserted so as to be at all sensible to the eye, an undulated country is erroneously represented as consisting of plains and prominent elevations. But again I say that under proper instructions such objections diminish, and with a due convention between master and scholar it may be perfectly understood, that no altitudes under a certain height are represented, and that all heights, though having a direct proportion to each other, bear no exact proportion either to the diameter of the earth or to the horizontal area displayed.

I have already dwelt too long on this subject, and now pass to topographical models. Of these there may be said to be two kinds, the first forming the passage, as it were, from the relief map to the perfect model. In these the portion of country is generally small, and all the irregularities of the ground are noted; the scale of heights is, however, as in the maps, different from the horizontal scale, so that such models do not give a perfectly correct representation of the country. In the perfect model the scale is the same for both the vertical and horizontal distances, everything is represented in its true proportions, and the whole is a correct miniature of nature. Of such models many are in existence in various countries; they are generally confined to small and particular localities, and are constructed for a particular purpose. Such are, among others, the admirable geological models of Mr. Sopwith, of the Forest of Dean, &c. Geographical models of far more extensive districts, however, have been constructed, and of regions much more difficult to represent. Of these, that of a portion of Switzerland by General Plyffer, which you have all heard of, is now in the Museum of Lucern. Since the time of that ingenious officer the means of perfecting such objects have been greatly improved. After Plyffer followed Eajaguet, who executed a model of the Valley of Chamounie, and then Gaudin, whose reliefs of Switzerland are in *papier maché*. But the most perfect, and in every respect beautiful models of any country, are those sculptured in wood by M. Sené. His first model is that of the Simplon, which, begun in 1830, was terminated in 1833, and after having excited the admiration of all Paris, was purchased by his Majesty Louis Philippe for 12,000 francs.

But the *chef d'œuvre* of M. Sené, which, it is expected, will be finished next year, is a model of all the higher Alps comprised between Martigny in the Valais, the Great St. Bernard, the Allée Blanche, the Seigne, the Tours, le Bonhomme, the Val de Monte Joie, the baths of St. Gervais, Chède, the rocks and Col d'Auterne, the Buet and Tête Noire, round to Martigny, a circle of sixty leagues. This district encloses the Mont Blanc in its centre. The scale of this model is 1 line for 12 toises, so that Mont Blanc, which is 2453 toises above the sea, will, in the model, be 29½ inches in height. Half a million of pine-trees of three different sizes, and many thousand houses, churches, &c. have been adjusted to the scale. The lakes are represented by blue steel, as coming nearer the real colour of these alpine reservoirs than anything else that has been tried. This astonishing model will be 20 feet long, and 14 feet wide; eleven years have already been devoted to its production; it is all cut with a gouge and other carving instruments, in blocks of the wood of the lime-tree, and every portion is from actual and repeated observations on the spot.

When this model is laid before them, natural philosophers will be better enabled to argue correctly upon the question of glaciers, recently brought into notice through the writings of Charpentier, Venetz, Agassiz, and Forbes.

Desiderata.—To enumerate even a small portion of geographical desiderata would occupy many pages, and it is not my intention on this occasion to enter further upon this subject than to request your attention to what I consider a very valuable suggestion of my accomplished friend Dr. Henry Holland. Formerly distinguished by his travels in Iceland and other works, and now laboriously occupied in the details of his profession, in which he occupies so eminent a place, Dr. Holland still contrives to pass over wide regions during his short vacations, on which occasions, though unable to work out geographical problems, he necessarily falls in with many undescribed features. Wishing to be of utility to others who may have more leisure than himself, and also desirous of increasing the connexions and usefulness of this Society, he has suggested a plan which the Council have adopted. A large book, having the title of *Desiderata*, now lies in your Meeting room, wherein every Member, or friend of a Member, may insert such queries or suggestions concerning particular objects of research, as may occur to them from their own sources of study, information, or observation. Few travellers of intelligence have visited a country without gaining notice of objects beyond what they themselves have had the opportunity to attain, and such notices must have considerable value when recorded as

they may now be, for the direction of future travellers in the same districts. It will be the duty of the officers to register and index these queries so that at all times the *desiderata* concerning any one tract of country can at once be referred to; and I entertain the hope that through this plan many Members of our Society, whether in public life or otherwise, too much occupied to become authors of long memoirs, will thus take a pleasure in uniting with us in pointing out new sources of information and inquiry. To exemplify the object of his plan, Dr. Holland has already inserted several valuable notices in the volume of *Desiderata*.

Forthcoming Memoirs.—In addition to all the memoirs which have been read before the Society, I have the pleasure to state that many good contributions are in our possession for future reading. Of these I may cite 'The Physical Geography of Lower Canada, by Mr. Wittich,' 'An Account of an Ascent of the Old Calabar River in Western Africa, by Dr. King,' 'A Description of the Island of St. Mary's in the Azores, by the Consul Mr. Carew Hunt,' 'The Recital of an Exploratory Journey to Lake Torrens, by Capt. E. C. Frome,' and 'A Memoir on Chinese and European Maps of China, by Mr. W. Huttman,' and 'Notes of Routes in Kutch Gundava, by Capt. Postans.'

To these, with many others which have yet to flow in upon us, I hope to call your notice at the ensuing Anniversary; and I merely now mention them to show that we are ourselves well supplied with literary materials; whilst our perspicuous and indefatigable Secretary will doubtless gather in and collate, as he has in this and preceding years, the copious results obtained by foreign geographers.

Conclusion.—We have now, gentlemen, reached the end of a report upon the recent progress of our science, which, long as you may consider it, is still, I know but too well, a very inadequate sketch of the labours of geographers during the single year which has elapsed, and those (certainly no members of our own body) who ask the question, whether much remains to be accomplished? may be assured, that the record of the next year will be quite as voluminous as that of the past. Great as modern advances have been, wide and varied is the field yet open to us and to posterity, for vast is the superficies of land not yet even glanced at by geographical pioneers, whilst much more enormous is the surface of the planet still excluded from the application of true scientific research! But why feel surprise in reflecting on such a fact, when we know that even in this highly cultivated country, it is only within these very few years that the true positions of the northern and western headlands of our islands were determined!

From what has been accomplished, then, let us turn cheerfully and hopefully to consider what may yet be done by a British Society for the extension of geographical knowledge, if fully and powerfully supported. To the vast desiderata in Australia, Africa, and parts of Asia, I have already adverted : and in conclusion I will now therefore briefly ask you what great discoveries might not be made in the vast continent of China, so recently opened by our nation to European enterprise? Referring you to what I have previously said concerning the probable distribution of precious ores in the northern portion of that empire, what vast benefits might not flow, both to our new allies and to ourselves, from competent surveys? But, alas! gentlemen, we actually present in our own body the refutation of the proverb, that "if there's a will there's a way." Where in the civilized world is to be found a knot of individuals pursuing science for its own sake, who have more vigorously displayed their devotion to the cause of geographical knowledge, or who have more freely sacrificed health and fortune in its attainment, than many of the members of the Society over which I have the honour to preside? There is, however, necessarily a limit to that which can be accomplished, when pecuniary means are wanting. Though, fortunately for us, travelling and colonizing are still as much the ruling passions of Englishmen as they were in the days of Raleigh and Drake, and though we are from time to time sustained by the recital of their gratuitous researches; still, unless a certain amount of steady income be at our disposal, the exertions of a society like this must be paralyzed, and their sphere of utility sadly diminished. Thus, as you well know, for a time we went on employing, at our own cost, scientific travellers competent to explore those tracts with which we most desired to become acquainted; but owing to increased expenditure, and a wish to husband our capital, chiefly with the view of purchasing a building for our place of meeting, our career of usefulness has, I regret to say, been checked; the disbursements having been restrained to payments for official management and the publication of our volumes.

I pointedly allude to this subject, not only because I trust my associates will redouble their exertions in procuring new adherents, through whose subscriptions our funds may be augmented; but also with the view of inciting Her Majesty's Government to afford some slight aid to a body, whose usefulness they must acknowledge, since their leading members belong to it, two of them having, indeed, already filled the Chair.*

* The Earl of Ripon and General Sir George Murray.

If, independently of its volumes, and of the great stimulus it has given to many works of great national utility, this Society had done nothing more than procure maps of all known lands and seas, and so arrange them that they are at all times ready to be consulted by the Government and the public, it has by that act alone a most undoubted claim upon the country.

No great European kingdom, except England, is without some national establishment for general geographical purposes, and if, to fill that void, the Royal Geographical Society has accomplished the same end through its own energy and means, surely the least we are entitled to is some share, however limited, of a patronage which has been bestowed on other societies not more useful—none of them certainly so directly connected with the objects of the Government as ourselves. We do not ask for pecuniary aid, since the liberality and spirit of our members will, I doubt not, sustain our finances. But when he sees that we are cramped in our capacity for doing good, I fervently hope that before another anniversary arrives, the distinguished statesman—one of our own fellows—who, in presiding over Her Majesty's Government, has evinced by many acts that he is a true friend of science, will do for us that which he has already done for other bodies, in granting some apartment for the meetings of a Society exclusively devoted to the public interests, and of which Her Majesty is the Patron. By such an act he will save us a heavy annual outlay, and will enable us to apply a corresponding amount of our income to the real extension of geographical science.

This, Gentlemen, as far as I can see, *is the one thing only wanting* to ensure the continuance of a career which must be successful so long as it is sustained by the hearty co-operation of men who, disdaining all sordid considerations, are linked together in a noble pursuit, highly gratifying to themselves, and of the deepest importance to the progress of civilization.

PAPERS READ

BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY.

I.—*Abyssinia—being a continuation of Routes in that Country* by Dr. CHARLES T. BEKE.

[Dr. Beke's communications having been made by letter, at different times, it has been deemed advisable to drop the epistolary form and give the whole as a connected narrative, which is now taken up from the time of the traveller's residence at Dima, where he had arrived on the 29th of November, 1841, as mentioned in vol. xii. p. 258 of the Journal, and where he remained till the 20th January, 1842.—Ed.]

January 20th, 1842.—The Rás having entered the territories of the Dejasmach, as mentioned in my last communication,* the latter proceeded to join him in the beginning of this month, and after continuing with him a short time, returned to the neighbourhood of Dima, on his way to Démbecha, and I was directed to accompany him thither. I accordingly started this morning from Dima for the purpose of joining him. The road led at first along the river Gadd, through the district of Dima, the country being all barren, but still, towards the river, affording a scanty pasturage to numerous herds. After crossing the stream, which was here only 3 or 4 feet wide and almost dry, we entered the district of Yazínna: the bank of the river which we ascended was steep and covered with brushwood, but the road soon became more level. To the right was visible an elevated range of mountains called Tálba Wáha. The country through which we now passed is, like the greater portion of Gójam, an extensive grassy plain, without trees, and with very little population or cultivation. Passing at a short distance to our left the village of Yezarázar, we saw before us the conical peak of Débiet rising abruptly from the plain, and then, descending gradually past the village of Yéraz, we came to the junction of the rivers Súba and Yebért. Above

* See vol. xii. p. 258.

the junction these streams have scarcely any current, but afterwards, the ground falling, the Súha (which is also the name of the united streams) goes with a tolerably rapid course S.S.E. to the Abáí. Where we crossed it (just below the junction), it was about 10 feet wide and a foot or so deep. The country now becomes more irregular, and in places rather more cultivated, whilst to the right it rises towards the mountainous district in that direction. Before reaching the river Múga we passed Adgílla, formerly a capital of Rás Gúksa. The Múga is about 20 feet wide and 2 feet deep, with a brisk course to the S.E. In about an hour after crossing this river, we passed between two small isolated saddle-mountains; that to the right being called Kúih, and that to the left A'ngach; a small stream called Bóra running between them. They appear to be the elongation of a side ridge of the mountains to the N. The plain beyond A'ngach, which bears the name of A'ishal, has of late years been the arena of several conflicts, namely, between Déjach Záudie and D. Gwálu; D. Góshu and D. Matántu; D. Fánta and D. Táddela; and D. Góshu and D. Gwálu. About 2 miles beyond the Bóra we arrived at the Béchet; soon after crossing which stream we reached the camp of the Dejazmach, at a place called Déboza, situate at a short distance to the S.S.E. of Zówa, formerly a capital of Rás Háilu.

21st.—This morning I set off early, in company with the Dejazmach, on the road westward to Démbecha. The ground was at first irregular, the way running nearer to the mountainous country on our right; but afterwards it becomes more level. After passing several insignificant villages and small streams, we crossed the brook Gáttela, near the village Káskas, in the vicinity of which, at a place called Angátta, the battle was fought, in September, 1841, between the Dejazmach and his son Biru, which for a time gave the whole of these countries into the hands of the latter: it lasted two days. About an hour after this we left to our right the monastery of Yederebán, in former times of considerable importance, but now gone much into decay. The country here is clothed with numerous acacias and wild-rose bushes; but it soon resumes its former more general character, that of a mere grassy plain. At near 2 hours' slow riding from Yederebán, we crossed the brook Shigaza, and came to our station for the day, at a short distance from the village of Zál.

22nd.—On quitting our station of last night we proceeded over the plain in a direction nearly W., and soon crossed the river Chámoga, which runs between earthy banks about 10 feet high, with scarcely any current, in a channel 15 feet wide and about 2 feet deep. The country presents nothing whatever to interest, the ground being irregular and much broken, and alternately covered

with grass and low brushwood. Several small streams are crossed, the whole with scarcely any current, this locality appearing to form the watershed between the W. and E., and in the rainy season being no doubt filled with swamps. After about 3 hours' slow riding we reached the river Djjil, here a small brook, the waters of which creep along to the N.W., towards the Gódieb; whilst all the previous watercourses proceed southward. Soon after crossing this stream we arrived at our station, close to the village of Lachiláchita.

24th.—During Sunday we remained encamped at Lachiláchita. On leaving it this morning a brook and swamp were crossed, which form the boundary of an extensive tract of brushwood to the left of our road, which we skirted for some time. The river Djjil, which we crossed on our last day's journey, soon became visible, winding round, so that we again crossed it twice in the course of to-day. The first time, its banks were clothed with thick brushwood, and its channel was about 15 feet wide, with a sluggish stream, about a foot deep, running S.W.; the second time, which was shortly before its junction with the Gódieb, its channel had increased somewhat in width, though not in depth, and its course was now about N.W. On crossing this river for the last time, we quitted Gójam and entered Dámot, and a vast difference between the two provinces was soon perceptible. The former is noted for its scarcity of wood; the latter, gently undulating, is copiously studded with fine trees, of which some are of considerable size. It is also much more peopled, and numerous villages are passed on the way. The river Gódieb, where we crossed it, is much larger than the Djjil, being at least 30 feet wide and 2 feet deep, but, like the other, has a very slow current. Its course is W.S.W. In about half an hour after passing this river we reached our station, about a mile to the S.E. of the large village of Arrát. Through the whole of our road we kept the mountains on our right hand, but with less elevation than on former days, and the extreme end of them bears about N. of this place.

27th.—As the Dejzmach did not wish to stop near Démbecha, lest his soldiers should violate the sanctuary (for, like Dima, it contains a celebrated monastery), he remained at Arrát until to-day, for the purpose of transacting such business as he had in this neighbourhood. When we left this morning, the road was at first tolerably level, the country being well cultivated and possessing numerous villages, but being neither so well wooded nor of so picturesque an appearance as previously. After a ride of little more than an hour, the ground became more irregular as we approached the low bluff end of the mountains which we had seen to the N. from Arrát, on turning which the much loftier mountainous district to the N.E. presented itself to our view. We

ngwsoon came to the valley of the river Tāmcha, which river, 20 feet wide and a foot or more deep, with a strong current and a stony bottom, runs in a westerly direction between steep banks, which we had to descend on foot. After ascending the opposite bank, the country became again more level as far as the smaller stream Gúdela, which, although nearly as broad as the Tāmcha, at the spot where we crossed it, has evidently been made so artificially, a number of stones having been thrown into its bed in order to render it fordable at all seasons to the inhabitants of the neighbouring town of Démbecha. At a short distance from the ford, however, it appeared to be not more than 6 or 8 feet wide, running with a slow winding course south-westward, between gradually sloping banks. From hence a ride of half an hour brought us to the large town of Démbecha, situated on the slope of another ridge of the mountains coming from the N.E. We did not, however, enter the place; but, skirting it, took up our encampment above it to the N.W. at a short distance, where the Dejasmach remained for a couple of days only, when he again set off to join the Rás, leaving me behind till his return. At Démbecha I was compelled to remain till the beginning of March, when, peace being restored and the Dejasmach having returned, I was at length able to leave that place; and one of the Dejasmach's daughters, Oizoro Wálleta Georgis, leaving Démbecha to join her husband, Dejach Bária, the ruler of Agaumider, I availed myself of the opportunity to visit that province.

March 8th.—On leaving Démbecha this morning, the road led westward, descending through a beautiful country, well peopled and cultivated, and plentifully wooded. Two rivers were passed during the day: the Galémbit, about 15 feet wide and 1 foot deep, running briskly to the S.W. between earthy banks; and the Díjjil, a shallow muddy stream of greater width, but with scarcely any current. The country now entered is called Fitzabading, at a village in which, of the name of Yewórada, we stopped. Here I saw for the first time a considerable plantation of the *Enset* described by Bruce. In Shoa, and on the road, a few plants are frequently met with; but in this country the number is great.

9th.—This morning our road continued through a most delightful country, which, with its numerous trees and cattle grazing among them gave me, in the cool of the morning, the idea more of an English than of an African landscape. The whole district bears the name of Fitzabading; and the Dejasmach is so impressed with its beauty and fertility, that he retains a considerable portion of it in his own hands (although not his paternal or maternal domain), instead of investing his chiefs with it. A tolerably thick wood which lay before us made us now turn

N. and N.E. to Wójet, a beautiful village belonging to the Dejazmach's daughter, Oízero Kébitu. After passing by Wójet we began a steep descent into the valley of the river Bír; before reaching which river, however, the ground became again level, and continued so for upwards of a mile. The river Yecháreka was to our right as we descended, and the Bír was crossed just below the junction of the two rivers. At the passage the Bír is divided by a small patch of brushwood into two streams, the smaller one being about 30 feet wide and a foot or more deep, and the other about 50 feet wide and 2 feet deep; both running rapidly, with a considerable fall, towards the W. The sides of the river are clothed with thick brushwood, and the descent in the immediate vicinity is very steep, it having to be made on foot. Below the ford, the high country, which on our road we had left at some distance, approaches close to the river, presenting from the opposite side, which is low and level, the appearance of mountains of some elevation. At some little distance above the junction of the Yecháreka the Bír is joined by another river, the Kácham. The valley of the Bír is not unfrequently subjected to the predatory inroads of the A'muru Gallas inhabiting the opposite bank of the Abáí, who are said sometimes to penetrate into the country above the point where we crossed it. After passing the Bír, the way at first continued westward, above, but parallel with, the river; but we soon left it, proceeding N.W.; when, in less than an hour, we came to a rocky tract of volcanic origin, covered with a wood of kolqualls of some extent: I had never seen so many of these curious-looking trees together. On passing through this wood, we arrived at the river Gerái, called also Tekúr-wáha (black water), from its bed consisting of dark volcanic rocks, the colour of which is reflected in the stream, which is further overhung with large trees. The Gerái is about 30 feet wide and 2 feet deep. The contrast between the two sides of this river is very remarkable. We had made our way to it through a thick wood; but on the farther side, after passing the trees with which its immediate banks are lined, we came at once upon an open plain with scarcely a single tree within sight. Shortly after leaving the Gerái we reached the Lakh, of about the same width as the former river, but shallow, running over a stony bed. The country here, called Wácha, is studded with villages, and is, if any thing, even more fertile than Fitzabad, being irrigated by numerous canals from the Lakh. Next we passed the two small shallow streams Zéa and Pásasit, each not more than 10 feet wide; and at a short distance beyond the latter we came to the large town of Mánkusa, containing the monastery of St. Michael, where we alighted.

10th.—On quitting Mánkusa we proceeded through a con-

tinuation of the same fertile country, watered by several streams, all tributary to the Bír, but all of them, with the exception of the Debohella, being small torrents. The whole run over stony beds with a considerable fall, which enables the farmers to turf off the water above into artificial channels for the irrigation of their fields. Our road was continually intersected by these water-courses, which hurried westward through innumerable plantations of every species of the productions of the country, whilst the inhabitants were busily employed in ploughing the ground for other crops. The river Debohella, where we crossed it, was about 20 feet in width and 1 foot in depth. When we started this morning I was told we should stop for the night at Búrie; but on reaching the village of Salála, where we alighted for a short time, I found that we had left that place at a little distance to the S.W. After passing the neighbourhood of Búrie the road lay more northward, through a more woody country, towards the frontiers of Agaumíder, which we were now approaching. We stopped for the night at the village of Wássua.

11th.—As it was settled that we should most probably not move to-day, or, if we did, it would not be till towards the evening, I thought it a good opportunity for me to go as far as Búrie, which place I reached after a ride of a couple of hours. It consists of three separate villages on the banks of the river I'sser, at a distance of upwards of half a mile from each other, with the three churches of St. Abbo, St. John, and St. Michael. The two former are to the west of the river, and I did not go to them, my visit (which was but a flying one, as I intended proceeding thither at a subsequent period) being confined to the district of St. Michael. The Mohammedan merchants' district, Islamgie, lies lower down towards the river. The district of St. Abbo forms the town, properly so called, of Burie, which was the residence of the Dejazmachs of Dámot, till Dejach Góshu removed his capital to Gúdera. The present Rás 'Alí was born at Búrie, when his father Dejach A'llula was governor of Dámot. The I'sser is formed by the junction of three streams just above the town; the I'sser itself, the Dúti, and the Mángana.

After resting a short time at Búrie, I returned to Wássua, where I found all busy preparing to start. The distance we travelled was, however, very trifling, being less than a couple of hours' ride; at first ascending through a thick brushwood, and then proceeding over a clear plain country, but still slightly rising, from which we obtained a view of the mountains of Agaumíder. Our resting-place was A'zga, situate at the foot, to the south, of Mount Kurb, bearing, in the direction towards us, the appearance of an isolated cone, but being in reality the extremity of a range of mountains from the north. At A'zga the inhabitants all understand Amharic, but

their language is the Agáwi, a harsh guttural dialect, of which I have collected a vocabulary.

13th.—After staying a day at A'zga, we proceeded westward to the river Fá-tzam, about 30 feet wide and 2 feet deep, with a rapid course southward over a stony bottom. After crossing the Fá-tzam by a natural ford, we entered the district of Gwágwusa, beyond which we passed the river Zíngini, which here forms the boundary between Dámot and Agaumíder. This river, though of considerable width—at least 30 yards—has no depth, its waters finding their way among the volcanic rocks, of which its bed is composed. We now entered the district of Tummahá, and continued our course through a country exhibiting unequivocal signs of a volcanic origin. The fertile soil is formed by the disintegration of the rock which continually protrudes on the surface, and which is immediately turned to agricultural purposes. We appeared to-day to be travelling along a mountain ridge of some elevation, between ranges of mountains of yet greater height.

14th.—Our resting-place of last night was called Gies, and on leaving it this morning we had at first the mountains to the left, which we soon approached and began ascending, taking our course, after a ride of three hours, between the two peaks or domes of Fudi and Gámбах, after crossing the ridge between which we entered the country of A'skuna, one of the seven districts of Agaumíder. The mountains which we passed to-day are of a strongly marked character, consisting of a mass of volcanic cones or high-pointed domes. The entire country is, in fact, of a like origin, the rock everywhere peeping through the soil covering it, which is of a heavy argillaceous description, but which the industry of the inhabitants, aided by artificial irrigation, causes to produce abundant crops. After traversing the ridge we began descending north-westward to our resting-place, Cherafúchi, in a valley surrounded by mountains on all sides except the west.

15th.—This morning we at first proceeded down the valley westward, but after a time turned the end of the mountains to the right, and crossed another valley district called Bári, after which we began ascending the ridge of Mount Fádí, forming the division between Bári and Bánja, which latter, like A'skuna, is a basin surrounded by mountains except towards the west. The capital of Dejach Bária, if it may be called by such a name, is known also by the name of Bánja, in Agáwi Banjahá. It consists of merely a few huts occupied by himself and family and their immediate attendants; the village, which was formerly of much greater extent, having been burnt last year by Oizoro Ménen, the Rás's mother, in conjunction with Dejach Góshu. A number of small streams were crossed to-day, but they would scarcely appear to have water enough to carry them much farther, except the

Bári, in the district of that name, which joins the Guchéghti, and the Gidáni which joins the Témbil, both which rivers unite with the Dúrra, a tributary of the Abáí, in the country of the Shánkalas.

16th.—This morning I walked about a mile N.E. to the river Témbil, which is here about 10 feet in width and a foot in depth, running W.N.W. to the Dúrra. In my way back I went a short distance westward to a small village of Falásha weavers, with whom I entered into conversation, and from whom (on a subsequent as well as the present occasion) I obtained a number of words of their language. It bears, in many instances, a close resemblance to the Agáwi. In both, the harsh guttural sound of the Arabic ع (which, in my vocabulary, is represented by *gh*) is extremely prevalent. Their name in their own dialect is Falássa, in Agáwi Filisi: in Amharic they are called Falásha. They do not permit any one to enter their houses, or to touch them or their clothes. In case of the former law being infringed, they desert the house; and in case of the latter they wash their whole bodies and clothes in running water, on which account their residences are always in the neighbourhood of some stream. They say that they are the children of Israel. Their priests (of whom I saw one) are under as strict an interdict with respect to the rest of the people as these are in regard to strangers. They cannot even eat the food prepared by others, but have to grind their grain and bake their own bread, leading a life of celibacy in a separate dwelling, which the others are forbidden to enter. The Faláshas are weavers, some few are also smiths: the women are potters.

17th.—My wish, on visiting Bánja, being to proceed as far westward as practicable, I this morning left that place for Matákel, the extreme limit of Dejach Bária's territories in the desired direction. The road descended slightly towards the west, through a country traversed by several streams, all tributary to the Dúrra. The Zili and Guchéghti are each about 20 feet broad, and a foot or more deep: the others are inconsiderable brooks. The country passed through is mostly covered with brushwood, with occasional patches of cultivation; but in the lower portions it becomes more open and better cultivated. The mountains which close the basin of Bánja to the left fall by degrees, and we proceeded westward round the base of them, and subsequently of others, all forming part of the system of volcanic mountains, of which Fúdi seems to be the centre, the remarkable dome of that name being visible far above the whole. On the road we passed a lad keeping cattle, and my attendants seized him by the arm, saying they would sell him to the Turk (myself). The poor child was dragged along for some distance in tears, till I rode up and ordered them

to desist. It was a perfect picture of slave-stealing as practised in these countries. After a ride of five hours and a half we reached Chughái, in the district of Matákkal, on the frontier of Agaumíder, towards the valley of the Abái, which is inhabited by Shánkalas (the Nubas of the maps), who are negroes. It was market-day at Chughái, and many of these Shánkalas had come up to sell small bales of cotton, gourds of butter, &c. My appearance set the whole market in an uproar, no white man having been seen there before; and so great was the commotion that I was obliged to leave it much sooner than I wished, and before I could obtain any information of much importance; as it was evident that as long as I was present no business would be done. The Shánkalas, in particular, exhibited signs of the greatest fear at my presence; fine tall muscular men, armed with spear and knife, hurrying away and hiding themselves among the bushes as I approached. They wore no clothing, having merely a narrow thong of elephant's hide round the waist, in which the knife is stuck, and another, made of the bark of trees, which passes between the legs. I am informed that they dig pits for the elephant in its path to the watering-places, which they cover over with branches of trees, grass, &c., and when the animal has fallen into one of these, they despatch him with their spears. These negroes form the slave population of Agaumíder, where they are in great numbers, and many are also to be met with in Dámot and Gójan. They are captured in the expeditions into their country of Dejach Bária and his chiefs.

Beyond the Shánkalas to the W. or S.W. are a tribe of Gallas called Wámbera, many of whom are also captured by the Agáwis. Like the Shánkalas, they inhabit the valley of the Abái, and they would appear to be those of their widely spread nation who have penetrated farthest in that direction. They are not negroes, but are of various shades of colour, like the Abyssinians generally and the other Galla tribes.

To the N. of the Shánkalas is the country of Gínjar, inhabited by Mohammedan blacks, whose language, as I had the means of ascertaining from a conversation with a man and woman of that country, both slaves of Dejach Bária, is a corrupt Arabic. The man came from the district of Aburámila (which name is in the maps extended to the whole country of Gínjar), who said that his country is a week's journey from Bánja, and two from Kuára. The woman was from a district called El 'Atish, close to Kuára. Both, like the Shánkalas, were negroes. Their country is principally subjected to the inroads of the Abyssinians of Kuára and Démbea, and it furnishes many slaves to the market of Gondar; but the Egyptians (Turks) from the N.W. also take large numbers of them.

The people of Agaumíder, as it is called in Amharic—the native name is Aghaghá—in appearance, dress, manners, and religion do not differ from the rest of the Abyssinians, with whom they have for a long time been incorporated. They say that their original country was Lasta, where there are still A'gau tribes remaining, and that they left it in consequence of their father (chief) having killed his brother, when they moved westward, displacing the Shánkalas, who were the previous occupiers of this country. The seven sons of this emigrant became the fathers of the still existing seven tribes of Agaumíder. In this clanship they appear to vary from the other Abyssinians, among whom I am not aware of anything of the sort existing. They also think it no sin to sell slaves, which, as is well known, the Abyssinians generally refrain from doing, from religious motives. But in other respects they seem to observe all the religious forms and ceremonies of their neighbours, and assert their orthodoxy quite as strongly as those do. I wished to learn when Christianity was first introduced among them, but they would not hear of their ancestors having ever been pagans. A priest told me, however, that Agaumíder was conquered by the Emperor Jobannes, who made the inhabitants of the country build churches and adopt the religion of Abyssinia. It is not now the time to indulge in speculations, as facts are more than sufficient to occupy my attention; but I may just remark that it is not improbable that these two people, the Faláshas and Agáwis, are the remains of the early inhabitants of Abyssinia, who in the course of ages were displaced by more recent settlers from the opposite shores of the Red Sea, or by invaders from the south. An examination of the other dialects of this country, of which there are several, will no doubt tend to throw light upon this subject.

21st.—After a stay of nearly a week at Bánja, I this morning left it on my return to Démbecha, by the way of Gíesh and Gúdera. The road went eastward, ascending the mountains; and in near a couple of hours we reached an extensive and level meadow, called Zímбири, filled with herds, over which we proceeded, crossing the river Témbil near its source. It is here a small limpid brook, the winding course of which is marked by a double row of trees lining its banks. The plain of Zímбири took about an hour to cross, when we again continued slightly ascending, and in rather more than another hour we approached Mount Barf, on which is a considerable monastery dedicated to the Abyssinian saint Lalíbalá. Still continuing our course eastward and south-eastward, we skirted the mountain for some time, first passing the river Gúder, just at its junction with another small stream, and then began crossing a ridge branching from Mount Barf, the ascent of which was very steep and difficult. The Gúder, which

is here a small shallow stream about four yards in breadth, falls (I am told) into the A'sher, which joins the Baħr-el-azrek far to the N. of the Dúrra and Bolássa. Our road now led more southward through the fertile district of Démeka, the principal village of which we soon reached, and stopped at for the night.

22nd.—From Démeka we proceeded at first over a mountainous country covered with wood, but still presenting frequent spots of cultivation. By degrees the ground got clearer as we approached the upper course of the river Fá-tzam, here divided into two small streams, the larger one being about 10 feet wide. Subsequently the country became a fine plain, covered with numerous villages, and well cultivated. We now approached the frontiers of Dámot, on passing which the district of A'shfa was entered, at the residence of the Shum of which, Balámbarás Sákóm, we stopped.

23rd.—It was understood when I left Bánja that the Balámbarás would provide me with an escort to the source of the Abái; but he happening to be at Démbecha in attendance on the Déjasmach, his wife (a daughter of Dejach Bária) was unable or unwilling to supply me with people, and I was told that I must not think of proceeding thither alone, as the place was deserted, and, besides, the road lay through a forest, in which I was sure to be robbed. All this was, to a certain extent, true enough, although (as I afterwards found) with a good deal of exaggeration. However, I allowed myself to be persuaded, and proceeded, therefore, on my return road towards Démbecha; intending either to get an escort at my next resting-place, or else to defer my visit to Gíesh till after Easter (this year a month later here than with us), when the Dejasmach would come to Gúdera. This morning's road was somewhat descending among mountains; and crossing the river Lakh and several other small streams, we came, after a ride of upwards of two hours, into the plain in which Gúdera, the Dejasmach's capital and residence in the rainy season, is situated. On crossing the plain and reaching the spot, I was surprised to find it almost entirely deserted, and the huts of which it is composed for the far greater part in ruins; but such, I was told, is its condition during the greater portion of the year, when it is not visited by the Dejasmach. It is only about four years since he removed hither from Búrie. Gúdera is placed on a mass of volcanic rocks rising slightly above the plain, which during the rains is to a wide extent covered with water, forming then an extension of a small lake to the eastward of the place. The residences of the Dejasmach and some of his principal officers, and the church of Tékla Háimanot, are on a sort of citadel formed by a small prominence of the same rock. From Gúdera we went across to the lake, from whence, after a circuitous road over the rocky plain,

we proceeded round the back of the mountains to the east of it, into the district of Assoa, putting up at Dúmeri, the residence of the Shum.

24th.—At Dúmeri I met Balámbarás Sákom returning home from Dénbecha, who had not much difficulty in persuading me to accompany him back to A'shfa, from whence he promised me an escort to Gíesh Abáí. Our yesterday's road by Gúdera had been very circuitous, but to-day we proceeded in almost a straight line westward, leaving the plain of Gúdera to the N., and keeping almost all the whole way on tolerably level ground. During the heat of the day we rested at Shákwit, the residence of a relative of the Balámbarás, and continuing our journey in the afternoon, were overtaken by a violent storm of hail and rain, which wetted the whole party to the skin long before we could reach our place of destination. The mountains during the whole road—we appeared to be going along the summit of a low ridge—are of the same volcanic description as the rocks of Gúdera, being evidently a continuation of those of Agaumíder; but they are here everywhere covered with cultivated fields.

26th.—After remaining a day at A'shfa, I started this morning to visit the source of the Abáí. Our course was at first level through a fine country, to the mountain chain of Jínnit and A'labal, which we crossed, having first passed the source of the river Lakh, beyond which we entered the district of Sákkala, which extends to some distance eastward. On descending to the opposite side of the mountain past the sources of the river Fá-tzam, we came to a view of Mount Gíesh, in which several streams have their rise, uniting to the northward with that to which by universal assent the name of Abáí is more especially given. After crossing Mount Jínnit the road was tolerably level, Mount Gíesh being to our right hand, till we came to a valley to the left, beyond which, on a gradually rising eminence, is the church of St. Michael. We turned off a little way north-eastward into a swampy piece of ground covered with grass and rushes, and surrounded with trees of no great size and brushwood, in about the centre of which a spot was pointed out to me as the source of the Abáí. At first it was scarcely distinguishable from the rest of the marsh; but on approaching and inspecting it more closely, a small collection of water about a foot in diameter was visible among the rushes, which could just be reached with the hand when kneeling on a narrow mound of sod which partly surrounded it. From this spot the course of the river was pointed out to me as proceeding south-eastward, after which it turns eastward, north-eastward, and then N. round the church-hill. No water is, however, visible aboveground for a considerable distance; and as far as I could see, the course of the river was only marked by a con-

tinuation of the swamp along the valley. To the N.N.W. of the principal source another was shown me at about 5 yards distance from it, a patch of dry ground of about 2 yards in width being between the two, and the rest being all swamp. I asked for a third source, but was told there was no other. The church is not visible from the spot on account of the intervening trees, but its bearing is about N. 35° E. That of the summit of Mount Giesh is about S. 60° W. On questioning my guides as to the celebration of religious ceremonies here, they scorned the idea of their performing anything of the sort, being Christians; but they admitted that yearly in the month of Hedár, or Tahsás (about the end of November), after the rainy season, and when the ground is sufficiently dry to allow of it, an ox is slaughtered on the spot by the neighbouring Shum, and its blood is allowed to flow into the spring, its flesh being eaten on the ground. I could not learn that any particular ceremonies accompany this act. Also at the close of the Abyssinian year (the beginning of September), on the eve of St. John, sick persons are brought hither and left for seven days, which they say ensures their recovery. Logs of wood have from time to time been laid round the source to serve as a bed for these sick visitants, but they have sunk in the quagmire; still traces of them are visible, and they serve to give a certain degree of solidity to the otherwise unstable soil. These practices are evidently remains of a higher degree of veneration paid to the spot at a period when the inhabitants of the country were not converted to Christianity.

On quitting the source of the Abáí we returned first into the road we had left, and then proceeded south-eastward, having the course of the river to our left for a short way, when it turns off to the E. and N. At the distance of about a quarter of a mile we came to the brow of the mountain, from which an extensive and beautiful view is obtained southward of the lake of Gúdera and the adjacent country. From this point we began a steep descent of probably from 200 to 300 feet, which brought us to the house of the priest of the Church of St. Michael, where we put up. The elevation of this spot I make to be 8520 feet.* The elevation of the summit of Mount Giesh may be about 1000 feet above the source of the river. The only observation I could take for latitude was of Antares, which gave $10^{\circ} 56' 27''$ N.; differing $3'$ from the latitude as determined by Bruce ($10^{\circ} 59' 25''$). As, however, mine is a single observation taken in the face of a bright full moon—clouds had prevented me from observing earlier during the night—I place no reliance on the result come to by

* This and all other heights mentioned by Dr. Beke were determined by the boiling-point of water.—ED.

me, beyond its serving to prove in a general way the correctness of Bruce's observations. I was informed that a village formerly existed here; but the inhabitants have now all left the spot, except the priest and the occupants of two or three houses. I need scarcely add that this priest is a Christian minister.

At about a quarter of a mile from the priest's house, westward, is the remarkable cave at the foot of Mount Giesh, visited and described by Bruce. In the afternoon I also went to examine it under the guidance of the priest. The approach to it is not at all easy, being through a thick plantation of canes, hiding from view the entrances, of which there are several in the face of the rock. The one at which I entered was so low as to compel me to stoop and almost creep in; but after a passage thus of 3 or 4 yards the roof rises to the height of 10 or 12 feet at least. Our entrance drove out numerous birds which make the cave their haunt. The cavity we were now in appeared to be some 20 yards in extent, but my guide told me that it continues underground as far as Mount Alabal, where there is an outlet, and that people go through with torches. During the rains the whole cave is filled with water.

I have not with me Bruce's account of his visit to this interesting spot, having merely taken a few notes when at Ankober, from an abstract of his work. I am not prepared therefore to comment on any discrepancies that may appear to exist between his account of it and mine: nor is this indeed the place to do so; it is sufficient for me to note down things as I found them at the period of my visit.*

27th.—My stay at the priest's house only lasted till this morning. On leaving it we continued descending the face of the mountain through a thick wood, crossing the small stream Gúdi three times before reaching the plain, where we again passed it. The road now led past Gúdera, from whence we proceeded by a more direct path over the mountains to A'ssoa, reaching the house of our host of Wednesday last after a ride of about 4 hours.

28th.—The road from Dúmeri to-day led across the valley-plain of A'ssoa, and over Mount Sagwodit, the ascent and descent of which are very steep, into another valley district named Arboásh, closed to the S. by low hills. On crossing these latter the district of Yemálog was traversed, and that of Dinu, watered by the river Lazza, was entered. This river, which joins the Bír, is a small brook about 10 feet wide and less than a foot deep, with a rapid current. Soon after passing by this river (it was not crossed here) we reached the village of Charr, where we stopped.

* The account alluded to by Dr. Beke will be found in Bruce, vol. iii. ch. 14.—See also Murray's 'Life of Bruce,' pp. 382—387 (4th. edit.).—Ed.

The bluff of the mountains behind Démbecha was visible from the time we crossed Mount Sagwodit, bearing there about S. 30° E.

29th.—This morning's ride brought me back to Démbecha after an absence of three weeks, during which I traversed a country the greater part of which had not previously been visited by any European. The road of to-day was for some distance level, but it began to rise as we approached the mountains towards the E. On the way the rivers Bír, Kácham, and Yecháreka were crossed at a higher point of their course, the first being still a considerable stream, as its rocky bed manifests, although at present, at nearly the close of the dry season, it is not more than about 15 feet wide, with a depth of perhaps a foot. During the rains it increases in size so as to be unpassable. It is proper to remark here that I have given the dimensions of the several streams as I estimated them at the place of crossing. In most cases this will be to a certain extent incorrect, as the fords, whether natural or artificial, are shallower, and at the same time broader than the rest of the stream.

April 7th.—A week only after my return to Démbecha from Agaumíder, the Dejzmach left for the N. on a military campaign; and I having been invited by his eldest legitimate son, Aito Dóri (who had been a patient of mine since the end of last year), to accompany him on a visit to a relative of his in Gójam, we this day left Démbecha together, and in the afternoon reached Amwátta, a little way beyond Lachiláchita, by a route somewhat higher up and shorter than that by which I came in company with the Dejzmach in January last.

8th.—To-day our road lay altogether to the S. of our former one, crossing the river Yeda, where the valley widens, and the country becomes more mountainous as it approaches the Abái, and passing Dágat, the capital and principal residence of the rulers of Gójam since the time of Ras Háilu, the greatgrandfather of Bírú, the present Dejzmach of this province. Beyond Dágat the ground becomes more level as far as Zánami, one of the villages belonging to Oizoro Wálleta Georgis, a daughter of Ras Háilu and the maternal aunt of Dejach Góshu, where we stopped for the night. The contrast between Gójam and Dámot is almost more striking in returning into the former country than it was on leaving it; scarcely a tree being to be seen, with the exception of the small groves which invariably surround the churches. Even the brushwood lining the banks of a few of the rivers—and in most cases they are with scarcely a bush in their vicinity—is spare and stunted; whereas in Dámot it partakes more of the character of a forest.

9th.—A ride of about an hour and a half brought us to Ká-

nyaras, another village belonging to Oizoro Wálleta Georgis, where she was residing, and where I remained until Easter, with the exception of a few days when I made an excursion to Dima and Debra Wark. Kányaras is situated on the prolongation of a ridge from the high mountains to the N., and its elevation is a good deal above that of the points measured on my former journey westward.

22nd.—This morning I left Kányaras for Bichana, the road lying to the southward of my former one, and being through a country of a more irregular description, the ground rising between the rivers to a greater extent than it does more northward. After a ride of 2 hours I reached the foot of Mount Débiet, a small cone of probably 300 feet in height, and about 500 feet in diameter at the base. The size of this hill would of itself be insufficient to render it visible so far off as it is, were it not raised on a base of considerable elevation, being the flat summit of a side ridge of the Talba Wáha mountains. At the foot of Mount Débiet, on each side, are two churches respectively dedicated to the Saviour and the Holy Virgin. From hence our road continued eastward to Bichana, the ground breaking and falling towards the Abáí at no great distance along to the S.

23rd.—The road from Bichana to Dima, which I went to day, is already known. (See vol. xii. p. 257.)

25th.—After resting yesterday at Dima, I this morning left for Debra Wark, which place I reached after a ride of rather more than 3 hours through an uninteresting country, traversed by a number of small streams, the ground rising towards the N.W. Debra Wark is a large town on the road between Gondar and Baso, situate on a conical eminence in the fork of the two small streams Tázza and Zinjut. The Tázza afterwards joins the Idán and two rivers of the name of Chée, and the four united flow to the Abáí. Debra Wark contains a celebrated monastery dedicated to the Holy Virgin. After remaining there a short time, I returned the same afternoon to Dima by another road a little higher up towards the mountains.

26th.—The return road from Dima to Kányaras was at first the same as that by which I had proceeded to Démbecha; but it afterwards turns more to the S., passing between Angach and Débiet.

28th.—As the family I was residing with removed to Zánami to keep the Easter holidays, we this morning left for that place.

May 7th.—This morning I rode to Mélli, about an hour and a half distant from Zánami, for the purpose of taking a few bearings to connect my former with my present route.

9th.—The holidays having terminated, I this morning took leave of my friends and proceeded on my way to Yejúbbi, because if I delayed my visit any longer I should lose the opportunity of con-

versing with the merchants from beyond the Abáí, who return to their countries before the rainy season sets in. The road to-day lay south-westward, at first slightly descending, but tolerably level, and crossing the river Gáttela. On passing the village Gwadálema the first regular descent towards the Abáí takes place, consisting of a complete *step* of probably a couple of hundred feet, which step is visible to a considerable distance westward, forming in appearance from the lower ground a low range of hills. From thence the ground still continues falling, although very slightly, as we approached the large town of Yáush, containing the monastery of St. Michael; on the way to which, the small stream Zíba, which falls into the Yéda, is crossed twice. As we left the high country and approached the valley the ground became more and more cultivated—the upper plain being for the most part mere pasture-ground—and near Yáush almost the whole land is under tillage.

12th.—A ride of 2 hours nearly westward, crossing the river Yéda, which at the close of the dry season is a mere ditch, brought us to Yejúbbi, a large commercial town close to the market of Báso.

On the Sunday after my arrival at Yejúbbi the weekly kafilah from that town and Báso market to the Galla countries beyond the Abáí, was attacked and plundered by a party of Kuttai Gallas, who had crossed the river from the S.E., several individuals being reported to have been murdered by them on the occasion. It was therefore deemed expedient to send a strong detachment of troops down to the Abáí with the kafilah of the ensuing week, for the purpose of escorting it, as also of protecting the one coming up to market from the opposite side of the river; and I gladly availed myself of the opportunity thus afforded me of visiting the Abáí in this direction.

Towards evening on Friday the 20th of May, I proceeded in the company of a neighbouring Shum westward towards the valley of the river Chámoga, into which we descended, stopping at the village of Dand after a short ride of about $2\frac{1}{2}$ hours. The descent from the high land of Gójam is extremely steep, and in some places almost precipitous; and on leaving it one finds oneself soon in the lower mountain country bounding the Abáí, and likewise extending some distance up the courses of its affluents. To the W. of the Chámoga, between it and the Wúterin, are Mounts Jibélla and Mútera, two remarkable peaks, being the continuation of the high land before it altogether falls towards the Abáí, much in the same way as the Amba of Dey is a prolongation of Shoa Miéda, between the Adabai and Bérsena. Mount Mútera, which, like Dey, is almost inaccessible, is used as a state prison and also as a place of refuge in case of invasion.

On the following morning (Saturday, May 21st) we continued our descent towards the Abáí, and after a ride of about 2 hours, on passing the village of Dúngwam, we reached an almost perpendicular cliff of at least 500 or 600 feet in height, down the face of which we descended on foot. This cliff is in a line with the riverward face of Mátera, and both are manifestly portions of the same *step* in the valley of the Abáí. On reaching the foot of this cliff the road proceeded more level, crossing the rivers Dann and Sans, but it became more steep again as we approached the Abáí, which we reached after a further ride of about 5 hours. At no great distance from the river we passed the place where the previous week's kafilah had been attacked. Here were the remains of *one* individual, a Mohammedan merchant, who had been killed by the marauders: his flesh was now nearly consumed by the hyænas and vultures. They said that *thirteen* persons in all were killed; but this I doubt exceedingly: at all events there were no traces of more than one dead body. At no great distance from it there was, it is true, the greater portion of a human skeleton; but this had evidently been there a much longer time, and it was in fact admitted to be that of a slave who had died on the road some time previously.

At the point at which we reached the Abáí that river is joined from the N. by a small stream called Laggaöldo, being the name by which the lower course of the Yeda is known among the Galla inhabitants of the valley. The ford over the Abáí is known by the name of Mélka Fúri; *Melka* in the Galla language meaning *ford*. The Abáí at this spot is not more than from 50 to 60 yards in width, and the greatest depth at this season is 5 feet, or perhaps rather less. Just below the junction of the Laggaöldo are rapids, but of no great fall or extent. When the river rises I should imagine all traces of them are lost. The elevation of the stream was found to be 2316 feet. This result is, however, subject to doubt, on account of the vessel used on this particular occasion for boiling the water having a narrow neck, which probably confined the steam. The latitude by observations of the moon and Jupiter I make $9^{\circ} 54' 40''$ N., being, within 3 miles at the most, the extreme southern limit of the course of the river Abáí. The rocky banks of the river are far more bold and precipitous than at the place where I crossed it on my way from Shoa.

On the road down to the river we were joined by numerous parties of soldiers, as also of merchants and country-people about to cross it; and on reaching the ford we found the up-coming kafilah busily engaged in passing over from the opposite side. This and a sort of market which was held on the beach at the junction of the Laggaöldo by those who did not go farther either

way, took up the time till the evening, when they, with ourselves, encamped for the night on the beach, which is of considerable extent.

Before sunrise the next morning (May 22) the whole party began their march, a body of soldiers proceeding in advance, whilst others flanked the kafilah and covered its rear. The road we took to-day is not that by which the kafilah usually comes; but it was chosen in preference as being more to the W., and getting sooner under the flank of the mountains. On reaching the station Karáro, to the S. of the river Sâns, the authorities stopped the kafilah to count the slaves and loads of ivory. I placed myself by their side, and could thus ascertain the tale without fear of falsification. There were 149 of the former, and 75 of the latter. The owners did all in their power to pass the slaves by uncounted, and as there was no barrier, or anything like previous arrangement (although the same task is repeated every week), it is not to be wondered at that they succeeded in several instances, as I myself witnessed. I should say, therefore, that the number may fairly be taken at 160. The horse and ass loads of ivory consisted in some cases of one, most frequently two, and in several three, four, and even more tusks; so that 75 pair of teeth, large and small, may safely be taken as their amount. The ivory was stated to exceed by far the weekly average; whilst on the other hand the number of the slaves was by all admitted to fall much below it. As the market takes place weekly during the season, which lasts about eight months, if the weekly average be estimated at only 200, this gives 7000 individuals as the yearly import.

The slaves are mostly children, male and female, from the Galla countries beyond the Abáí, extending southward to Káffa, Enárea, and Jánjero, and, in fact, far beyond. Many of them are Christians, others are Mohammedans, but the greater portion are pagan Gallas. Their colour generally—but there are many exceptions—is lighter than that of the Abyssinians, and some are not of darker complexion than the natives of southern Europe. A smaller portion consists of Shánkalas or Negroes from the low country to the S.W.

The ivory comes principally from Enárea, as does also the coffee—of which there were large quantities, though I could not count the loads—as likewise gold and civet. From the nearer Galla countries, especially the adjoining one of Gúdera, cloths are bought in considerable numbers, as also much iron and cattle.

The constant state of warfare in which the Gallas live, renders it, I am assured by all, utterly impossible for a single traveller to penetrate through their country; and as far as I am yet informed, the Mohammedan merchants would object to his accompanying them, as his presence would only expose them to greater risks and

obstacles than they are subject to under existing circumstances. Both Mr. Bell, an English gentleman, and M. Blondel, the Belgian consul-general in Egypt, who lately visited this country, were most desirous of proceeding to Enárea, but found it impracticable.

After bringing up the kafilah to beyond the river Dann, and thus placing it in safety, the escort returned home, leaving the merchants to come up as they thought fit to the market of the following day. I, with the Shum, whom I had accompanied down to the river, returned to Yejúbbi by a road rather to the eastward of that by which we descended on Friday.

On my arrival at Yejúbbi, I learned that the Dejazmach had broken up his camp in Miecha, and was on the point of returning to Démbecha, whither I immediately proceeded to join him, leaving Yejúbbi on the 25th May, and reaching Démbecha on the 29th. My journal presents little of interest, as the general features of the country have already been made known from my previous routes across it. My course this time was yet farther to the southward than previously, crossing the river Chámoga just where it breaks from the plains and falls towards the Abáí. At this spot I met with a number of date-palms in full fruit. I had frequently seen stunted plants on the high land, and had inquired whether they were not the date-palm, but was assured they were not. On the present occasion, however, I had the means of ascertaining their identity by picking and eating the fruit. It was small, and the pulp, though soft, was exceedingly acerb. I am told that when quite ripe it is very pleasant eating, although it never attains any great degree of sweetness. The elevation was here nearly, if not quite, 5000 feet, and I have met with stunted plants at least 1000 feet higher.

On the road to Démbecha, I passed several parties of merchants proceeding hither on their way to Gondar and Massówah (by the Abyssinians called Matzúwa), with slaves, ivory, coffee, &c. The slaves go along without the least restraint, singing and chatting, and apparently perfectly happy. They are generally treated with attention, stopping frequently on the road to rest and feed. They are mostly well dressed, and many of them wear conical caps of plantain-leaves to protect them from the sun. The girls, almost without exception, have necklaces of beads. In fact, it is not to the interest of their owners to treat them otherwise than well; for as more than one merchant has said to me at Yejúbbi, when asking for medicine for them, "they are our property (*kábt*, literally *cattle*), and we cannot afford to lose them." They generally invest the best-looking of their female slaves, in most cases a full-grown girl, with the title of wife during the journey, and she is in consequence treated with an extra degree of attention and kindness, being frequently

mounted on a mule, and on their arrival at the station for the day having a hut built for her reception, besides receiving from the others the respect to which her temporary rank entitles her. But this does not prevent her from being sold with the rest on reaching their place of destination. All the female slaves, however, without exception, whatever their number, and however tender their age,—and many are children of eight or nine years at most—are the concubines of their master and his servants during the journey; the same continuing through the various changes of ownership until they are disposed of to their ultimate possessors.

On my arrival at Démbecha, I learned that the Dejazmach was not coming thither, it being his intention first to undertake an expedition against the Kúttai Gallas, in the direction of whose country he was already on his march. Being desirous of accompanying him beyond the Abáí, I lost no time in returning to Yáush, as his road would pass near that place; and on the 3rd of June I left Démbecha, proceeding that day to Amwátta by a road in some slight degree varying from any I had hitherto travelled.

On the following morning I left Amwátta, taking the road by which I had come from Yejúbbi, as far as the river Chámoga, soon after passing which river we turned off rather more to the E. On the way we met with a numerous kafilah of merchants with slaves, ivory, coffee, gold, civet, &c., proceeding to Gondar and Massówah, by the way of Démbecha. Several of them were of the party in whose company I had come up from the Abáí, they having been detained thus long near Yejúbbi, arranging with the authorities as to the amount of tribute or duty to be paid by them; a proceeding which in this country takes up no little time.

At Yáush I remained until the 14th, expecting the arrival of the Dejazmaches Goshu and Bíru; on which day, hearing that they were to arrive at the camp near the village of Yekantát, I proceeded thither in a S.E. direction over a level country, reaching it after a slow ride of about two hours. Towards the latter part of the way we passed a number of springs, the waters of which find their way eastward, going to form in part a small stream named Giát, which we also crossed shortly before reaching the camp. The Dejazmaches not having yet arrived, I went and took up my quarters in the village of Gánnat, about half a mile distant from the camp.

June 18th.—It was not until to-day (the Dejazmaches having arrived on the 16th) that the march towards the Abáí commenced. The road, although on the whole descending, was for the greater part tolerably level, proceeding along a ridge from the table-land, running about S.W. between the valley of the Abáí and that of

the Laggáldo. The ridge by degrees acquires a more mountainous character, and after passing close to the peak of Mount Kómi, it ends in a precipice similar to that on the road to Mélka Fúri, down the face of which we descended on foot, encamping at a short distance from the bottom of it, at the small village of Gímám, just past a small stream, on the banks of which grow a number of lime-trees. Mount Zémi, an amba of lower elevation than Kómi, is at a short distance westward, at the foot of which a market is held frequented by the Kúttai and Gúderu Gallas.

During the night after our arrival at Gímám, a tremendous storm took place, the rain falling in such torrents that the Abáï rose at once about three feet, washing away several persons. This discouraged the Dejazmaches and their forces, who regarding it as the commencement of the rainy season, were afraid not merely that their progress through the enemy's country would be impeded, but that their return across the river would be rendered a matter of difficulty and danger. Several parties of soldiers who had already crossed the river came back, and the Dejazmaches, although not until after much deliberation, decided on abandoning the campaign and returning home.

As, however, I did not like to leave the vicinity without visiting the Abáï, I obtained from Dejach Goshu an escort, and rather late in the day on the 20th descended to the river, which was at a very short distance from our station. The road at first descended steep to the village of Jijja, after which it continued tolerably level till we reached the edge of a precipitous ravine, at the bottom of which runs a small stream named Farándukh; whence descending steep round the foot of Mount Kelinto, we soon came to the Abáï. The descent, principally on foot, occupied in all upwards of three hours. Just before reaching the river we crossed the small torrent Ginkaméti, and at a short distance to our right (W.) was the ford Mélka Kúki. The Abáï had now sunk to its level previous to the rain of the 18th, that is, about knee deep. Its width here I estimated at about 70 or 80 yards, but it had evidently spread considerably on the opposite side, where a broad slip of low land was visible which the waters had covered and again left. The banks of the river on this side are quite precipitous. I boiled my thermometer here under more favourable circumstances than at Melka Fúri (having taken down my own tin-pot), and found it to give an elevation of 2815 feet. The result only confirms my doubts as to the correctness of the observation at the former place; whilst its near approach to the result obtained at the spot where I crossed from Shoa (2936 feet), serves to establish the general correctness of both, and to determine with tolerable accuracy the elevation of the Abáï in this portion of its course. The bed of the river is here, as everywhere else, extremely wind-

ing. As remaining by the Abáí was deemed rather a dangerous experiment, for our party was but small, and several of the Kúttai Gallas were visible above on the opposite side—at least so they said, but I confess I did not see them—we lost no time in leaving the spot. Instead, however, of returning to the station, we ascended the steep amba of Kelinto, the upper portion of which consists of perpendicular masses of rock, forming a natural fortress deemed impregnable. It is inhabited by Gallas in allegiance to Gójam; and hither the inhabitants of the neighbouring low country flee when afraid of invasion, as at the present period. Here we stopped for the night.

21st.—The descent from Kelinto towards the N., although steep, is not so precipitous as on the side next the river, and it soon ends in an almost level ridge, at first very narrow, but afterwards increasing in breadth, which unites it with Mount Mitú, an amba of smaller size and lower elevation. From thence the road ascends, being at the latter part very steep, until the brow of the mountains is reached, from which we descended to our station of the 18th. We here fell into our former road, along which we continued till near reaching the peak of Kómi, when we turned off to the house of the Shum of the district, where we put up for the night.

22nd.—This morning a thick mist, which filled the whole atmosphere, hid everything from sight; but on our reaching the church of St. Michael Kómi it rose for a moment, so as to afford a glimpse of the junction of the river Múger with the Abáí, the courses of the two rivers appearing like winding lines of silver. The Múger in the lower part of its course forms the boundary between the Túloma and Kúttai Gallas. We now returned by the former road as far as the village of Gándegab, where the Dejasmach had stopped for the night, in whose train I returned to Yáush.

A few days afterwards the Dejasmach left Yáush for his capital, Gudara, where he passed the rainy season, and whither he wished me to accompany him. As however I anticipated that I could employ myself much more profitably in collecting information at Yáush and Yejúbbi, I declined his invitation; and I accordingly took up my residence at the former place, occasionally visiting the latter.

As soon as the setting in of the fine weather would permit, I was glad to remove from the stationary position in which I had remained so long. My first step was to pay a visit to the Dejasmach in Dámot, for the purpose (among other things) of obtaining a person to accompany a messenger whom I wished to despatch to Shoa with letters.

I accordingly quitted Yáush on the 10th of October by the

way of Yejúbbi and Báso market, proceeding thence to Yegúda by the road of May the 25th and 27th last. The Chámoga, which is the principal river on the way, although considerably increased in width and rapidity, was not very much so in depth, as I could cross it on my mule without getting wet. The other rivers were all fordable without much difficulty, the main obstacle being at times their muddy banks and bottoms, which often caused delay and a considerable circuit to find a ford. On the road I fell in with several parties of merchants going with slaves and coffee to Gondar. They had passed the rains at Yejúbbi, and now as soon as the way was practicable they were proceeding to a bare market, where for nearly two months they would be without competition.

Oct. 12th.—I left Yegúda, proceeding to Yédesh by the road of May 27th, and thence continuing rather more to the S. than on the former occasion, crossing the rivers Sháku and Tzied somewhat lower down, as also another small stream named Tashét, and entering the province of Machákel, a fine level country. I reached the Dejazmach at Tejagóter, the residence of the governor of Jánabiet, a separate jurisdiction within the territory of Dámot, but appertaining (as far as I could understand) to Gójam. Boundary questions are not always easy matters at home; no wonder then that in Africa they should not be readily unravelled.

13th.—To-day the Dejazmach proceeded a short distance to Chágo, the residence of his son Fitaurári Tésama, the governor of the province of Jáwi, whither I accompanied him. Jáwi is the country which would appear formerly to have borne the name of Gáfát; but having been taken possession of by the seven tribes of the Jáwi Gallas from beyond the Abáí, it has received its present denomination from them, the original name being lost; but traces of it are yet found in the Gáfát *language*, which is still spoken here and in the neighbourhood. I collected about a couple of hundred words from a native, who gave them to me as belonging to this language: the far greater part are, however, Amharic, either quite pure or at most but slightly modified; whilst on the other hand those which really vary from that language have not the remotest connexion (as far as I can trace) either with it or with the A'gau dialect formerly spoken throughout the greater part of the peninsula, or with the Galla.

15th.—After remaining yesterday with the Dejazmach, who promised to give me a person to accompany my servant, I this morning left Chágo, and returned to Yegúda by a road yet a little more to the S. than that by which we came, and approaching the point at which the ground breaks towards the Abáí. The river Tashét was crossed at the head of a fine cascade of about 60 feet fall.

21st.—Having returned from Yegúda to Yáush by the previous road, I remained here until this morning, when the Dejazmach's messenger to Shoa having arrived, I started on a projected tour through Gójam, &c., taking in the first instance the road towards Shébal, for the purpose of seeing the messenger and my servant thus far on their way. This time—as I never go twice by the same road if I can possibly avoid it—the way led farther S. than on any previous occasion, passing the several rivers of Gójam at or close to the point where they fall precipitously from the table-land towards the Abáí. To-day, after skirting the valley provinces of Liban and Kamboát, both of which, like Báso and Jáwi, derive their names from the Galla tribes who have settled in them, we put up for the night at the small village of E'nabi, near the edge of the large central province of Dérebic. Kamboát would appear to have derived its name from the southern country of "Cambat," visited by Fernandez in the beginning of the seventeenth century; and as these people give no other name to the country occupied by them than that of their tribe, Cambat must at that time have been a Galla possession.

22nd.—To-day's road continued through Dérebic, the Galla provinces (now so in name only) of Déjjen and Gúbea being below to the right. The river Súba was crossed at the head of a fine broad fall, which however, like all the others, dwindles almost to nothing as the dry weather continues. Our night's resting-place was Gánteng, in the sub-district of Enamai, not far distant from the Galla province of Shebal, by which last year I entered this country from Shoa.

23rd.—At Gánteng I this morning parted from my messengers, they proceeding to the house of a Shum at no great distance from thence, who had orders to provide for their passage of the Abáí, and I turning towards Bichana, where I intended to pass the day. Dejach Biru, whose capital Bichana is, was however gone to Enábsie, and none of his Shums being in the way to provide me with a lodging, I proceeded to Yéraz, a village in the demesne of Dejach Goshu, where I rested.

24th.—Leaving Yéraz we this morning proceeded to Débra Wark by a road farther to the W., and consequently on a higher level than those taken by me on my former visits to that place, and passing close to our left the village of Wóera, situate on an elevation visible from a considerable distance. From Débra Wark we advanced north-eastward to the village of Enámmi, on the edge of the valley of the river Chée, where we stopped for the night. On the road of to-day a number of streams were crossed, some tributaries of the Gadd and others of the Chée, but none deserving of mention except the Idán, which joins the latter river. Still the Idán is, even at the present season, but an inconsiderable

stream, being not more than 10 feet broad, with a depth little exceeding a foot.

25th.—The Chée, which we crossed on descending from Enámmi, is a river of note in this country, as it forms the boundary of Gójam to the N., separating it from the district provinces of Enábsie and Enássie, which although under the government of the rulers of the rest of the peninsula, form no part of Gójam Proper. In size and general appearance the Chée may, perhaps, be compared to the Ziéga Wódiám in Shoa, having a broad bed, which in the rains is filled, but from its rapid descent is again soon emptied. The level of its bed is however much lower than that of the Ziéga Wódiám, and its valley in consequence is considerably more elevated, approaching in extent that of the Jámma or even of the Abáí itself. The banks on each side are almost precipitous, and the descent occupied upwards of an hour. After crossing the river before ascending to the high land of Enábsie, the point of Gúndib Amba between the Chée and the Nefá, a tributary of some size, had to be rounded, and the latter river crossed; when the ascent began, being yet more steep than the descent on the opposite side. The elevation of Enábsie is considerable, the province consisting of a mountain mass, of which Mount Yékandach forms the core. It may readily be conceived that the acclivity towards the Abáí must be extremely abrupt and difficult, and the vulgar name of the mountain vouches for the fact. It is called *Ahia-fadj—kill-ass*. In the point between the Abáí and Chée is Mount Sómma, an amba, or hill-fort, of considerable strength. The Chée is formed above by the junction of two streams of the same name, the larger being distinguished as the Enát (Mother) Chée, the smaller as the Gúgal (Foal) Chée.

At a short distance from the edge of the valley of the Nefá is the town and monastery of Mártola Máriam, where Dejach Biru was at this time staying, and whither I proceeded. It is situated on a hill of some size, on the summit of which a mass of rock forms a natural fortress, the entrance to the place being at only one point, where there is a door. On arriving there I learned the existence of buildings within the churchyard, said to be the work of *Afrinj*—literally meaning *red pepper*, but evidently a corruption of *Franji*, i. e. Europeans. I lost no time in visiting them, and discovered an edifice, the walls of which are still in a perfect state, in the form of a Roman cross, built of rough stones and lime, faced in parts with freestone, and in the interior adorned with carvings in the latter material. These are of exquisite workmanship, and are still as fresh and sharp as if executed to-day: in particular must be mentioned an arch of 16 feet span. The tradition is that this work was performed *before* the time of

Ahmed Grañ (Mohammed Gragne), and that that conqueror ruined the building. The impression, however, on my mind certainly is that a later date must be attributed to the erection, and that it is the work of the Portuguese soldiers or missionaries, who did not visit the country until his time and subsequently. It is true Brancaléone and Covillan were in Abyssinia before the close of the fifteenth century, but I question whether they had workmen sufficient to execute works of such skill and labour as these of Mártola Máriam, together with similar ones which I am told exist in Ambára on the other side of the river, at Tadbaba Máriam and Atrónsa Máriam. At Waj, too, formerly the capital of the Empress Helena, and of the subsequent Emperors of Abyssinia until they removed to Gondar, there were buildings of the like description, but these have been entirely destroyed by the Gallas. It is proper to anticipate here the further information which I obtained at Karáneo. The Portuguese settlers in this country received a grant of lands at Shigie, between the Tammie and Azwári rivers, where they married and settled, and by degrees became assimilated with the natives of the country, many of the present inhabitants of Karáneo and the vicinity claiming descent from them. The designation which these foreigners bear at this latter place is *Francis*, which, if we did not know their history, would lead to the conclusion that they were *Frenchmen*. But this term, like the *A'frinj* of Mártola Máriam, is evidently a corruption of the generic name by which Europeans are known in the Levant.

But to return to the ruins of Mártola Máriam. The roof, which has altogether fallen in, was, according to tradition, covered with gold and silver, which led to its destruction by the Mohammedan invader. But as throughout the building the holes for the scaffolding are not filled up, it is reasonable to conclude that the work had never reached that state of completion when such ornaments, if used at all, are employed. On my return to Yáush I was informed that the erection extended much farther westward, but that only within the last few years the walls have been destroyed in order to build the present native church with the materials! The freestone in which the carvings are executed is of the finest texture, and I am told abounds in the neighbourhood; but not the slightest use is made of it in the present day.

Nov. 2nd.—I remained at Mártola Máriam until to-day, when the Dejazmach starting on his return home to Bichana by the upper road, I left in his company. Our road led north-westward, skirting the base of Mount Yékandach, and crossing numerous streams, none of any great note, all tributary to the Chée, the valley of which river lay below to the left. Our resting-place

was Enagállá, in the province of Enássie, which we had now entered.

3rd.—Taking leave of the Dejazmach, who remained at Enagállá for the day, I proceeded alone towards Móta. Having quitted the basin of the Chée, we to-day traversed that of the Azwári, the ford of which, crossed by us, was at least 10 yards wide, with a depth of near 2 feet, and with a rapid current. This river finds a place in our maps, being one of the very few within the Peninsula that I have been able to recognise. At about an hour's ride from the Azwári we crossed the Tämmie, a river of about equal size with the former, and soon after came to the monastery and town of Karáneo, situate close to the junction of the Tämmie, with a smaller river called the Tájatiel, where we alighted. The joint stream of the Tämmie and Azwári, which unites with the Abáï to the N.E. of Karáneo, bears the name of the former river. The Tämmie is, I apprehend, represented in the maps by the name "Temeë," the position of which is, however, far from correct, as indeed is the case with that of the Azwári.

4th.—From Karáneo we proceeded this morning north-westward to Móta, a large commercial town, and also a sanctuary, containing the Monastery of St. George. It is situated on the high road from Báso to Gondar through Gójam, and the passage of the Abáï is effected at the "Broken Bridge," which I shall next have occasion to mention. The other grand mercantile road, to which I have frequently alluded, lies through Démbecha in Dámot, and the Abáï is crossed at the "Bridge" considerably to the north-westward of Móta. On the road of to-day, we crossed the river Sáddie, about equal in size to the Tämmie. The country, which after leaving the foot of Mount Yékandach is level, resembles Gójam much in appearance, but the population is far more scanty.

5th.—A main object in coming to Móta was, that I might visit the "Broken Bridge" over the Abáï, in its neighbourhood. This morning, having procured a guide, I proceeded thither, by a road nearly north, at first level, and then descending to the river, but much more gradually than at any other part of the stream hitherto visited by me. On reaching the spot, I came to a bridge of nine arches, the centre one, about 60 feet in width, being the only one over the stream; the others, namely, three on the southern or Gójam bank, and five on the northern or Biégemider bank, being built on the rock, and serving for the approach on either side. The river here, both above and below the bridge, runs very rapidly, in a nearly straight course, E.S.E., and the principal portion of the bridge is built at right angles with the stream—namely, N.N.E. as near as may be. On the northern side, however, as the mountains come sharp down to the river, the line of the bridge is some-

what curved eastward, so as to form a junction with the road up their side. On the southern shore, over the first side arch, is erected a door, intended to shut off (if necessary) the communication from Biégemider. The bridge is without any parapet, and in width about 12 feet. It is built of rough stones and lime, the arches being turned in large flat bricks. It is the work of the Portuguese settlers in this country, and the date of its erection is said to be the reign of Hatzie Fásil (Fasilides). The centre arch has been sprung, as has also the first northern arch, and the ruins lie below in the bed of the river, being visible when the waters decrease, although not at the present season of the year, just after the rains. The author of this work of destruction is said to be Ras Fásil, the ruler of these provinces in the time of Bruce. The remainder of the erection is in very good repair, and it would be a work of but little labour to restore it to its pristine state, were such the will of the rulers of the country on this side the river. But their policy is, that it should remain as it is, rather than that a door should be opened to their powerful neighbour beyond the Abáí. This bridge, as I have already mentioned, is on the high road from Báso to Biégemider, and although not so useful to the merchants as it might be, it is still of considerable assistance in enabling them to cross the river; as, by means of ropes stretched across the open space, they manage to pass with their merchandize from the one side to the other, without entering the stream. The elevation of the Abáí, at this portion of its course, I make to be 3852 feet, water boiling at $204\frac{3}{4}^{\circ}$ about 10 feet above the stream, with the external temperature at 87° . From the river I returned to Móta the same evening.

7th.—It was my intention to proceed from Móta to Dámot, along the Tálba Wáha mountains; but I was informed by Dejach Biru that I must not go by that road, it being infested by freebooters, whom, it seems, he has not strength, or rather, perhaps, system enough to put down. As I could not ask him for a *large* escort to accompany me, I was therefore obliged to relinquish the idea, and content myself with crossing the ridge, which I did in the company of a number of merchants carrying rock-salt (the currency of the country) to Báso. These people were all Christians, in whose hands this trade principally is; and as they do not deal in slaves, who require to be spared on the road, they travel on much faster than the Mohammedan merchants. Our road from Móta lay almost due south, ascending the mountains towards the sources of the Támme and its affluents, and this day terminating on Mount Goéba, where we encamped for the night in the open air. The elevation of this spot is considerable (8751 feet), and the temperature was lower than I had hitherto met with in Africa, being 35° at sunset, and 29° only just before sunrise next morning.

• 8th.—We were off from our bleak resting-place before sunrise, but only to traverse a region yet more inhospitable. Still ascending southward, we crossed the upper course of the Azwári and its tributaries, just at their source; and after hurrying on as quickly as we could for about 3 hours, we arrived at the summit of the main ridge of mountains traversing this country. Before arriving at Goéba, we found the vegetation to consist in great part of heaths and ferns. This morning, as we continued ascending, the proportion of them increased, the stems of the former being covered with mosses. On the summit itself was nothing but stunted grass, with the remarkable plant *Jibárroa*, described by Rüppell (vol. i. p. 401). Hoar-frost lay on the ground, and ice of some thickness lined the brooks. A piece was brought me from 6 to 8 inches square, and nearly, if not quite, 1-8th of an inch thick. The elevation here cannot be less than 2000 feet above Mount Goéba, that is 11,000 feet, probably even more. The ridge continues in an extended plain westward, from whence flow the numerous streams which water the Peninsula in every direction, and then go to increase the volume of the Abáí. Crossing the ridge, and still keeping on a southward course, we descended the valley of the Múga, the sources of which river lay to our right, and arrived at Agámna, a monastery dedicated to St. George, where we alighted. Our companions the merchants, as is their wont, encamped in a meadow at a short distance from the place.

9th.—Leaving Agámna this morning, our road lay through the plains of Gójam, already traversed by me in several directions, till passing a little to the southward of the route of the 22nd October last, we came to Barch, the residence of Fitaurári Yémar, the governor of Gúbea, who had, when at Mótá, invited me to visit him.

13th.—Having been thus disconcerted in my plans with respect to the journey to Dámot, and expecting that my messenger would soon return from Shoa, I willingly accepted the offer of my host, that I should remain with him a few days. This morning, however, he was obliged to leave Barch, having been sent for by the Dejazmach; and I consequently quitted also, but in the opposite direction, proceeding to Kúttai, the residence of Dejach Engeda, the governor of the province of Kámboát. The road thither was little different from that of the 21st and 22nd Oct.

14th.—This morning I returned to Yáush by almost entirely the same road as I came from thence, having in my short three weeks' trip found more to interest me than I had met with previously in the country. The additions to and corrections of the geography of this portion of Abyssinia are also greater than on any previous occasion.

Dec. 6th.—My messenger having returned from Shoa with the intelligence of the approaching departure of the British mission

from that country, which rendered it necessary that I should send my letters thither immediately, I this morning left Yáush for Barch, to request Fitaurári Yémar to give me one of his people to accompany my servant. The road as far as Küttai was the same as that by which I returned to Yáush on the 14th of November. Thence I turned off rather to the southward of that road, and crossing the river A'bea, reached Santákie, near the brink of the valley of the Bechet, just below the junction of the Thábba, where I alighted for the night.

7th.—Leaving Santákie this morning, we proceeded for nearly a couple of hours skirting the valley of the river Thábba, when we came into our road of the 13th of November, along which we continued to Barch.

8th.—From Fitaurári Yémar I was not able to obtain a man, all his people (as he said) refusing to go in consequence of reports of war along the road by which I came last year. It was therefore necessary to seek another route; and my messenger making some difficulty about going alone through the country of the Wollo Gallas, I determined (unless we previously fell in with some merchants with whom he could go) on accompanying him across the river into the friendly country of Chákata, from whence, or from a short way beyond it, I apprehended a safe road into Shoa might be found. But this resolution of mine made my other servants revolt; and on my starting from Barch on the way to Barénta, they refused to go any farther with me, and actually quitted me. There was, however, no remedy: I must either proceed, or else remain without a further supply of money from Shoa, of which I stood so much in need, besides losing the opportunity of forwarding my letters to England. My messenger alone kept by me, saying that he would cross the Abái with me. From Barch, therefore, we proceeded north-eastward, coming soon into our road of the 22nd of October last, along which we continued; at the end passing Gánteng and A'nselal a little way to the N., and encamping at a short distance eastward of the latter place, in company with a party of Christian merchants from Yáush, proceeding to Tótola with coffee and cloths for sale. They being all friends of my servant, he having formerly traded in their company on the same road, an arrangement was soon made for him alone to accompany them; upon the understanding that if he found a good opportunity he should turn off from their road into Shoa, but if not, he should keep on with them as far as Tótola, from whence there is a constant safe communication with the Shoan market of Mariammi (Asséleli). A lad, the son of one of the merchants, was engaged to accompany myself; and all being thus settled satisfactorily, I proceeded with my (now two) servants a short distance to the village of Símbutan, where

we rested for the night; the merchants, as is their custom, remaining encamped in the open air.

9th.—This morning, parting from my faithful servant Wálda Georgis and his companions, I proceeded to Bichana, my present situation being very similar to that of last year, when, having been deserted by my servants, I reached Gójam almost alone. On arriving at Bichana, I learned that Dejach Biru was staying at Yékagan, the residence of Likamakwás Gebra Mariam, whither I proceeded to join him, for the purpose of asking for an escort to Dámot.

10th.—It was my wish to proceed at once on my projected journey into Dámot. But I having given the Dejazmach a few of my remaining garden-seeds, he insisted on my going with him to his garden at Shóla, close by, and then staying with him a couple of days at Bichana. I accordingly accompanied him this morning to the former place, situate on the brink of the valley of the river Balódeb, a small brook, where the ground breaks and falls to the eastward; and having sowed the seeds there, we ascended to Bichana.

14th.—It was not till this morning that I could obtain leave to depart, the Dejazmach supplying me with guides. The road, on this occasion, was different from any previous one, it passing to the southward of that by which I first traversed the country. Our resting-place for the night was the village of Bógana Gerár, situate a little way to the E. of the river Bógana, and being usually the first station of the merchants proceeding from Yejúbbi to Biégemider, &c. by the Debra Wark road.

15th.—Leaving Bógana Gerár, we continued at first to the southward of my former route, until in the vicinity of Yederebán we crossed it, and proceeding to the northward of it, took the road to Démbechá through the district of Gámmo. We put up for the night at the village of Asákaiñ.

16th.—The river Chamoga, which we reached soon after leaving Asákaiñ, was now so deep that a passage on muleback was not practicable, and I crossed it, therefore, by an almost natural bridge, consisting of a couple of trees extending across the stream, with a pole tied among the branches to hold on by with the hands. The animals swam across at the ford. But, after all, this river can be styled nothing more than a deep rapid brook, which in the dry weather is almost without water, as, in fact, is the case with all the rivers of this country. The Múga retains its waters the longest, being distinguished as “the chief (álaka) of the rivers of Gójam.” On leaving the open plain, the mountain country passed through is, as usual, covered with wood intermixed with frequent tracts and patches of cultivation. Our night’s resting-place was Amári.

17th.—From Amári we this morning proceeded, in the first instance, to Démbecha, crossing the Támcha by the upper ford, which is called Jibiye, the lower one being named A'dea. In the neighbourhood of Démbecha we learned that the Dejazmach (Gosbu) had quitted Gúdera for Mánkusa, and there was a talk of his removing on the 19th to Wambárrema. I decided, therefore, on proceeding at once to Mánkusa; but my guides saying there was no good resting-place on the lower road thither, we kept on the higher road (being that to Gúdera) as far as Charr, my resting-place of the 20th of March last, where we stopped for the night. The passage of the Bír was attended with some difficulty, and, as my guides informed me, not without danger. It ran, indeed, with fearful rapidity, and with a depth at the ford of nearly 4 feet; and on the bank, before crossing, we witnessed the effects of its violence in a couple of sheep which had just died on the passage. People, they say, are not unfrequently carried away by the stream.

18th.—Leaving Charr, we now turned westward to Mánkusa, on the way crossing numerous tributaries of the Bír and Lakh, as also the latter river. Arrived there, I learned that the Dejazmach had no intention of proceeding farther, but, on the contrary, would return to his capital, Gúdera, on the morning of the 20th. Thither I decided on accompanying him; and then, after again visiting the head of the Abáí, to descend to the valley of that river by the way of Wambárrema, and thence eastward back to Yáush to meet my messenger, who by that time I expected would be about returning from Shoa.

20th.—The Dejazmach left Mánkusa this morning for Gúdera, and I accompanied him; the road being northward through a tolerably level country, slightly rising. The plain in which Gúdera is situate was even at this time covered in many places with water, proceeding, apparently, from the small stream Zúggaz, which runs to the N. and W. of the town.

At Gúdera, on the 22nd, I had the misfortune to break my Newman's thermometer for determining heights by boiling water; a loss which was irreparable.

23rd.—This morning, having obtained a guide from the Dejazmach, I proceeded on a second visit to the source of the Abáí. The road I now took was to the eastward of that by which I descended from thence in March last, and the ascent was much easier. After reaching the summit of the low ridge extending westward between Mount Líchema and Mount Giesh, the road lies for some distance along the brow overlooking the plain in which Gúdera is placed. On arriving at the source of the river I found circumstances rather different from those on my former visit. From the greater proximity to the close of the rainy season, coupled, no doubt, with the unusual quantity of rain that had since fallen, the whole ground

was saturated with water, and it was impossible to reach the spot without continually sinking up to the ankles. The principal source was now more distinctly visible than on the former occasion; and according to my present view of it, I should thus describe it:—A small grassy mound, of about 2 feet 6 inches in diameter, stands in the centre of a circular channel or watercourse of from a foot to 18 inches in width, which channel is again surrounded by an irregular mound of earth. This latter is, however, most indefinite in its forms, and its existence as a circular mound cannot be positively asserted. In fact, it is perhaps fancy, with the preconceived idea of the existence of certain definite forms, that leads one to talk of anything but an irregular natural marsh, composed of grassy and rushy patches of bog, and pools and channels of water; the prevalence of the former in the dry season enabling one to see, or to imagine one sees, a circular mound of earth round the spring, and of the latter, shortly after the rains, a circular water-channel round a mound of earth.

Within the water-channel, and forming a part of it, is a circular orifice, likewise of about a foot, or rather more, in diameter, the direction of which is about N.W. of the central mound; which orifice is now perfectly free from weeds, and the limpid water in it stands up to the surface of the ground. The water from this source voids itself from the circular channel for the most part to the south-eastward, but there is also a break to the southward, through which a portion escapes.

On my arrival, I had sent for the priest of the neighbouring church, who soon came. He has removed from his former residence in the now deserted village of Wásha (literally, *cave*), below the brow of the mountain, to the village of A'shihi, close to the church. This latter, he tells me, is known by three names, A'shihi St. Michael, Abáí minch (source) St. Michael, and Gíesh St. Michael. He brought the cross of the church with him, with which he crossed and blessed the source before giving me some of the water to drink. On my inquiring what form of words he used, he was reluctant to answer. I asked, "Do you say, In the name of the Father, Son, and Holy Ghost?" "Yes." "Nothing else?" "Nothing else." But this assertion is not to be relied on, and I may remark that I found him apparently averse to answer any questions. The slaughtering of cattle at the spring, he says, has ceased. Whilst the custom continued the head and horns of the beast were thrown into the source. A countryman told me that it is customary to pour milk into the spring, in order to ascertain whether the person so doing will soon die or not. If it turns to blood, he will soon die; if it retains its natural colour, he will live. On plunging in a rod of about 6 feet in length, I found no bottom; and the priest said that it was unfathomable. The next morning,

however, I brought with me a long reed, which, at the depth of 7 feet 6 inches, found a large stone, and by avoiding this, it could be forced through mud about 18 inches or 2 feet farther; but beyond this there was no way for it. Nevertheless, the priest, and several country-people who were now with us, persisted in the assertion that the spring had no bottom, and that were it not for the stones and mud intervening, a way would be found through into the cave under Mount Giesh!

On questioning the priest as to the number of the springs, he replied, "There is no other: this alone is the Source of the Abāi." "True; the principal one. But there are others still." "Yes, there are seven altogether. Two are lower down"—pointing eastward—"and the others are round the church-hill." "But here in this marsh, close to the principal source, are there not others? One for instance lying out there?"—pointing to what had last March been shown me as the second source. At length, though with great reluctance, he admitted that there was a *second*, lying a little way off to the north-westward—the one described by me on my former visit—"but the water of it is bad," he said, "and is never drunk." This he repeated the next day (when I wanted to drink of it), as did also the countrymen in our company. The whole marsh may, however, be said to be full of springs, the water passing among the grass and rushes in every direction; the general bearing being to the eastward, in which direction lower down a *surface* of water was now visible; but I was told that the marsh was too unstable to allow it to be reached.

At Témkāt, or Epiphany (O.S., being the 18th of January), the Ark of the neighbouring church is brought down to the Source, with the ceremonies usual on that festival of the Church. Much water is then consumed, without its having any effect on the level of the spring; and they said that if a 1000 people were to drink of it, it would remain the same.

The marsh is thickly overgrown with kosso-trees and a yellow-flowering shrubby tree, called *ámija*,* very prevalent throughout the peninsula. These two trees may in fact be said to be the only ones growing in the vicinity of the spot. I have already stated that the language of the country is the Agáu.

Having rested awhile at the priest's house I proceeded in company with the Shum of Sákala, who had come up from Gúdera, a short distance northward to the village of Lécha, situate in the parish of St. Michael SÁNGAB. The name of Sákala is appli-

* Bruce (vol. iii. p. 643) calls this plant an *Hypericum*; but with the exception of two or three species, which attain 4 or 5 feet in height, the *Hypericum*, or St. John's wort, of which there are a great many species, seldom rises higher than 2½ or 3 feet. It is therefore probable that the plant in question is not an *Hypericum*, or, if it be, it cannot be called a *tree*, unless, indeed, it be a new species.—Ed.

cable to an extensive district, extending southward as far as Gúdera. Within it are *six* churches dedicated to St. Michael, of which that of A'shili is one, and that of SÁNGAB—which I apprehend to be that named by Bruce as "St. Michael Saccala"—is another. At Lecha I passed the night, and on the following morning (Dec. 24th) I went about a mile northward to visit the stream of the Abáí. On the road a small brook named BIRITU is crossed, which running westward joins the Abáí a little way lower down. The latter, at the spot where I reached it, has already become a good-sized mill-stream (as Bruce calls it), being some 2 yards—at times more, at times less—in width. Here is a ford leading to SÁNGAB Church, which lies near a mile to the N.W. of it. At the ford the river is considerably wider, and the stream, which hurries rapidly over a rocky bottom, here divides into two, forming a fall of perhaps 5 or 6 feet, and then re-uniting, the entire stream forms a second fall of rather greater height about 20 yards lower down. The course of the river is here about W.N.W., and from the descent of the valley in that direction the fall must be very considerable before it turns northward into the plain of Gúta.

I had reached the source of the Abáí on Friday in time for a meridian observation of the sun, which was taken in the marsh itself, within a few yards of the spring. The result gives $10^{\circ} 57' 36''$ as the latitude of this spot. On the following day I did not descend to Gúdera until I had again observed the sun. This I did rather to the southward of the marsh, at the brow of the mountain overlooking Gúdera; apparently nearly, if not precisely, the spot of Bruce's observation, "on the N. side of the cliff immediately above the priest's house." This I made to be $10^{\circ} 56' 46''$. My observation of the 26th of March last gives $10^{\circ} 56' 27''$ as the latitude of the priest's house at Wásha, which is yet a little farther to the southward. These three observations correspond so closely, that I am warranted in believing they are not materially incorrect; and from them I deduce the actual latitude of the source of the Abáí to be $10^{\circ} 57'$, or perhaps a fraction more; which in the construction of my map I have adopted in preference to that of Bruce, who places it in $10^{\circ} 59' 25''$, or 2 miles farther to the northward, but without pretending to assume the greater accuracy to myself.

In consequence of the unfortunate destruction of my thermometer I was unable to verify my previous determination of the elevation of the spot; I have, however, no reason to imagine that it is materially removed from the truth. The height of 8500, or a little more, is about equal to that of Angolálla, and the temperature and vegetation of the locality in which the head of the Abáí is found would certainly lead to the conclusion that it is, if

anything, lower rather than higher than that capital of Shōa. The prevailing crops of each country—barley—are the same. The elevation of Mount Gíesh, which I have estimated at 9500 feet, is much inferior to that of Mount Líchema on the opposite side of the plain of Bahrzáfa—as the lower portion of the district of Sákkala, extending as far S. as Gúdera, is called. It is proper to observe that Líchema is not to be confounded with Lijámbera, a mountain mass farther to the N., and not visible in this vicinity, said to be of greater extent but of lower elevation than the former. The superior height of Líchema to any of the neighbouring mountains is proved by its peak *alone* being visible at a very considerable distance.

Having finished my investigation of this interesting spot, I took my final leave of it soon after noon, and descended to Gúdera.

26th.—This morning, taking leave of the Dejasmach, I descended on my way to Wambárrema and the valley of the Abái. The road led a little to the westward of that by which I reached Gúdera the other day, passing through a lovely country, on the whole tolerably thickly peopled, well cultivated, and adorned with fine trees. The gradual fall of the country from the mountains to the Abái permits almost the whole of it to be artificially irrigated by merely diverting a portion of the waters of its numerous streams. The superiority of Dámot over Gójam, in respect both to beauty and fertility, is manifest. The inhabitants have, however, a worse character, which is in part attributable to the prejudice entertained against them on account of the *witchcraft* to which they are said to be addicted. This prejudice, as far as I can trace its origin, arises from the greater prevalence of rheumatic complaints in Dámot, which, instead of being referred to a natural cause—the greater humidity of the soil and atmosphere—is by the ignorant inhabitants supposed to be brought on by the ill will of *búdas*. I had intended to reach Búrie this evening, but not being able to do so, I put up for the night at the village of Dúbbi, in the district of Zába.

27th.—From Dúbbi, a slow ride of about two hours and a half brought us to Búrie. After crossing the I'sser, and before entering the town, I went a little way up the side of the river to visit some mineral springs of celebrity throughout the neighbourhood. They lie along the eastern side of the bed of the river, the water bubbling up in numerous points through the mud, with a copious development of gas. By planting a reed in the muddy bottom reaching some six inches above the surface, the water soon rose clear in it, running over at the end. Its temperature is in a trifling degree tepid, and to the taste it is very slightly saline, but strongly impregnated with carbonic acid gas. It has somewhat of a *marine* smell. It is said to be moderately purgative, but to have

a stronger effect as a diuretic. This may be the case if taken in considerable quantities: I drank nearly a quart without perceiving any effect except at first a slight sense of fulness in the head. They say that cattle which drink over-much of the water—and they are fond of it—die in consequence.

It was market-day at Búrie, and I visited the market, which, however, I found to be very small. It is occasionally visited by a few Gallas from Shínasha and A'muru. There is a Moslem village here, of which the inhabitants sometimes go beyond the Abáí. The Baso market is, however, now-a-days so generally frequented by the merchants, that it has drawn away from Búrie the trade which I apprehend formerly existed here.

28th.—Our road to-day from Búrie, instead of proceeding straight to our place of destination, lay nearly W., my guides being instructed to take me to the residence of the Shum of Wóbo, who would give further instructions as to my route. The country passed through is, on the whole, level and fertile, but presenting nothing worthy of remark, except that soon after crossing the river Fá-tzam we entered the basin of the Zingini, which river forms higher up the boundary between Dámot and Agaumíder: lower down the former province extends for some distance westward beyond this river.

29th.—Leaving Wóbo, where I passed the night, the road continued westward till it seemed that I was again being taken to Agaumíder instead of to Shínasha: at length, however, it turned southward in the desired direction. For upwards of three hours it now lay through a perfect wilderness covered with gigantic grass, at this time in seed, which completely hid everything from sight, and many of the halms of which were so tall that I could not reach their tops with the arm extended when mounted on my mule. Not a village was near, and (what I never experienced before in this country) not a soul met us during the whole of the above-mentioned period. At length, on nearing the brink of the valley of the Abáí, the country got clearer, and signs of cultivation appeared. We now began slightly descending, and towards evening reached the small village of Tzángariet, a short distance past Kólli, the residence of the Shum of the district of that name, to whom I was directed to be conducted. We did not go up to Kólli, as on the way we learned that he had descended towards the Abáí in company with his chief, Yashálaka* Gólem, to ravage the lower districts, the inhabitants of which had refused to pay an augmented tribute imposed on them. It was my wish to reach the camp this evening, but my guides said it was too late to go farther in the present unsettled state of the country, and we therefore

* *Contr.* of *yy-akh-álaka*, chief of a thousand, or chiliarch; a title of Abyssinian commanders, even of small bodies of troops.

put up at the village just named. Kôlli is situate in Shinasha, which is the name given in the Amharic and Gáfat languages to the country which, in Agáwi, is called Tzíntzi, but by the natives themselves Sínicho—clearly the Chinchon of the Portuguese. This name is given to the low country on *both* sides of the river, to which—or perhaps only to that on the southern side—the name of Góngá was formerly applied. The natives themselves retain the tradition of the former existence of this country as a separate state, and apply the name of Góngá, as well as that of Sínicho, to a considerable tract on the opposite side of the Abáí. I have been so fortunate as to obtain a copious vocabulary of the Góngá language, which appears to present few similarities to any of the surrounding dialects. It is altogether free from the harsh sounds which prevail in the Agáwi.

30th.—This morning we continued descending towards the Abáí by an excellent road, such as I never met with before in the *kólla* (valley), the descent being most gradual, winding gently down the sides of the mountains. There can be scarcely any doubt that this road was formerly the main channel of communication between northern Abyssinia and Enárea; it being, in fact, that taken by Fernandez in 1613. The inroads of the Gallas most probably cut off for a time all communication between the two countries; and when it was re-opened, the road by Báso and Gúdera would seem to have obtained the preference for reasons which it may not now be easy to ascertain. At present, as regards the commerce with the north, this road is still frequented by a few merchants who cross the Abáí to purchase slaves and ivory in Amuru, Jidda, Límму, and the other countries immediately to the S. of the river; but I do not learn that they go as far as Enárea, or even as Gúma and Wallégga, to which latter country it is the shorter road. My ride to-day did not exceed a couple of hours, when on reaching the village of Siénach where the camp was yesterday, I learned that Yashálaka Gólem had removed farther down the valley, and was told that it was impossible for me to proceed without an escort.

31st.—Yesterday morning, on reaching Siénach, I sent down to Yashálaka Gólem to announce my arrival, and this morning I proceeded with an escort of about 20 men to his camp at Mâbil. On informing him of my wish to descend to the Abáí, he said it was not safe for me to go, as the whole country was in arms, and I must, therefore, content myself with viewing the river from the spot where I was. I remained, accordingly, where I was during the remainder of this day and the greater part of the 1st of January, on which latter day the chief with his soldiers descended into the revolted district, returning in the afternoon laden with spoil, and bringing several captives, who, being *pagan* Gallas, were (with

their Shánkala attendants) doomed to slavery. For the following day a second expedition was contemplated, and I was invited to accompany it. But I declined this, preferring to return on the evening of the 1st to Siénach, in order that I might commence my return journey to Yáush on the following morning. From the point thus reached, the Abáí could not be more than three miles distant. The road down to the river itself is, I was informed, nearly as good as that by which I had descended; and on the opposite bank the ascent to the Galla table-land is of a similar character, their being only one little steep which requires to be ascended on foot. Its physical superiority over the Báso road is beyond all dispute, whatever may be the advantages of the latter in other respects.

Jan. 2, 1843.—Leaving Siénach, I ascended to the plain country by the road which I had descended; after which the way led more eastward, passing through Wambárrema, which name I find belongs to an extensive division of Dámot, parcelled out among a number of chiefs of the Dejzmach. From its vicinity to the Abáí and to the Galla countries on this side the river, the country, which appears capable of producing everything in abundance, is for the most part a mere waste, its population being quite insignificant. Our resting-place for the night was Abbakérra, the residence of the Shum of Limzámag, one of the subdivisions of Wambárrema.

3rd.—Our road continued the whole of this day through Wambárrema, which presented the same miserable appearance, rank grass covering the greater portion of the plain, and being only broken by swamps. As this country was entirely unknown to myself and servants, I was forwarded on from Shinasha through the hands of the Shums of the several districts, who sent countrymen on with us as guides. This occasioned a frequent changing—to-day I had as many as *five* different guides—besides a most circuitous route, the residences of the Shums not being at all in my line of march. In the evening I reached Débelin, the principal place of the district of that name, where I stopped.

4th.—Shortly after leaving Débelin this morning, we crossed the river Fá-tzam, which is here a considerable stream, being at least 50 feet in width, and running with great rapidity. The depth is, however, but trifling. Beyond this river the country of Wambárrema still extends a little way, when it is succeeded by Tzehenán. The greater part of this latter district is composed of the basin of the Bir, and in about a couple of hours after crossing the Fá-tzam we came to the termination of the almost uninterrupted plain in which our road had thus far lain, from whence we obtained an extensive view over another plain on a much lower level, into which we now began a considerable but gradual de-

scent. This descent continued until we reached the river *Salála*, which, increased by numerous tributaries, has here become an important stream. After crossing this river the country by degrees improves, till in the sub-district of *Wácha* it resumes the beautiful appearance with which I was so much struck on my former passage through this portion of *Dámot*. Our resting-place for the night is named *Zággai*.

5th.—Still continuing to traverse *Tzehenán*, we this day crossed the rivers *Debohélla*, *Lákh*, and *Gerái*, a little below my road of the 9th and 10th of March last, into which we at length fell, and then crossed the *Bír* at the same point as on that occasion. After crossing the *Bír*, the district of *Fitzabad* is entered, the basin of the river on this side being but of trifling extent, and ceasing in the abrupt manner I have already described. We stopped for the night at the village of *Hádis-A'mba*, our road now going rather to the S. of that of last year.

6th.—It had been my wish to return to *Gójam* by a road as far to the S. as possible; but my servants preferring a more northerly one, they used every argument to force me to go in that direction:—there was no road; the rivers were not fordable; the Gallas or robbers were to be feared, &c. I had yesterday been made to cross the *Bír* at the ford of last year, although I afterwards learned there is a very good one much lower down. To-day it was with the greatest difficulty that I got them to cross the *Támcha* at a point much below that crossed on any previous occasion, but they were afterwards leading me towards the so often traversed road between *Démbecha* and *Amwátta*, when I insisted on turning off to the southward. I had only two servants with me, and one—the lad I got at *Barénta*—left me in consequence; but with the other I went on to the village of *Gerárem* on the southern bank of the river *Gódieb*, where I soon found another man to accompany us to *Yáush*. The *Gódieb*, like the *Támcha*, joins the *Bír*, the principal river of *Dámot*; and, as I remarked on my first crossing the country, the grand watershed is between this river and its tributaries and the other rivers of *Gójam*.

7th.—At *Gerárem* I was enabled to make considerable additions to my *Gáfat* vocabulary, but still without at all satisfying myself regarding this language. The knowledge of it is far from general; the rising generation seem to be altogether ignorant of it; and those grown-up persons who profess to speak it are anything but familiar with it, since they frequently require consideration before giving the name of the simplest object. To-day our road led by *Dibdábi*, a large market-town principally inhabited by Mohammedans, and forming one of the stations on the grand Gondar road from *Báso*, which, as I have already mentioned, is by *Démbecha* (also a large market-town and residence of Moham-

medans) and the Upper or Miécha Bridge. On passing the frontier of Gójam we entered Gozámin, a district familiar to me from the numerous times I have had occasion to cross it in various directions; and reaching the village of A'sama (Abbo), we stopped there for the night.

8th.—From the part of the country at which I had now arrived, I had no alternative but to pass through Amwátta; but having done so, instead of continuing by the usual road round the head of the *kólla* of the river Chamoga, I took a somewhat circuitous route over the plain country to the north, and then, coming round close to the eastern brink of the valley of that river, put up at the village of Mánkafáñ.

9th.—Having a few purchases to make at Báso market, I proceeded thither this morning, it being market-day; and in the evening I put up at the village of Tar, just above the market-place.

10th.—This morning, on my way back to Yáush, I went a little way down the Yéda to visit a remarkable cavern under the fall of that river, by which during the rains a passage is effected from the one bank to the other. The fall is of about 80 feet, and at rather above the half of this distance is the passage across the river, the under strata of the rock having mouldered away through the infiltration of the water so as to form a cavity, almost regularly arched over above, of probably 50 yards in length, with a recess from the fall of 10 yards or rather more in the centre. Hence a ride of a couple of hours brought me back to Yáush.

16th.—Removed from Yáush to Yejúbbi, for the purpose of collecting there, whilst awaiting the return of my messenger from Shoa, additional information respecting the countries to the S. of the Abáñ; in which task, I am happy to say, I was singularly successful.* It was not till the 10th of February that Wálda Georgis arrived at Yejúbbi, bringing me the sum of *ten dollars*, with a confirmation of the news of the approaching departure of the British mission; the members of which had, when he left Shoa, already quitted Ankober for Channo to make preparations for their journey to the coast.

With this totally inadequate supply of funds, and without a prospect of receiving more—coupled as it was with the loss of the several articles intended as presents, &c., through the treachery of my former messenger, and with the destruction of my thermometer—it was quite impossible for me to think of remaining in Gojam, or of attempting to go farther; and I had, in fact, no alternative but to hasten to the coast as well as my scanty means would permit, and before any portion thereof should be

* The information here alluded to is given in the preceding volume of the Journal.—Ed.

exhausted. Having, therefore, made hurried preparations for the journey, I, on the afternoon of Monday the 20th of February, left Yejúbbi for Yáush, where I stopped for the night to take leave of my friends there. In these preparations my trusty servant Wálda Georgis was of inestimable service to me, he not only taking on himself the arrangement of everything, but volunteering to see me as far as the coast, and also engaging two respectable young men of Yáush to accompany me; they all three postponing all thoughts of payment for their services until our arrival at Massówah. Thus I commenced my journey under far better auspices than I had a right to anticipate, seeing the destitute position in which I was placed, alone in this distant country.

At the time of my despatching Wálda Georgis on his second mission to Shoa, I had contemplated the possibility of my leaving Gójám in one direction or the other; and, therefore, on visiting the Dejazmachs at Bichana and Gúdera, I had taken conditional leave of them. Thus there was nothing to prevent my quitting the country immediately I had fully determined on doing so.

February 21st.—This morning I left Yáush for Mota, in company with a numerous party of merchants carrying cloths thither for sale at the weekly Thursday market. A few also were taking coffee, oxen, horses and mules, and cloths, to the opposite side of the Abáí. Our route was a little to the westward of that by which I came from Zánami to Yáush in May last. The journey was, as usual with these traders, very rapid; and, by continuing on the whole day, we were able to reach Agamna in the evening.

Agamna is situate near the head of the basin of the river Bóra; and the people say that the sources of that river, forty-four in number, are in the immediate vicinity of the place. This is, however, merely an indefinite form of speech; and besides, it is not true, since some of the small streams uniting to form this river descend from the high ground farther to the N.

22nd.—Continuing our course in company with the market people, who increased in number as we proceeded, we this morning began the ascent of the Tálba Wáha mountains. The circumstances of our passage were, however, widely different from those accompanying that of the 8th of November last. Then, having encamped on Mount Goéba, at a considerable elevation, we reached the summit early in the morning; whilst, being on the north side of the ridge, the sun was not visible until that summit was attained. On the present occasion we were on the southern side, exposed during the ascent to the genial influence of that luminary, which, although the day was cloudy, was still sufficient to warm the air; whilst, from the greater distance of our starting-place, it was eleven o'clock or past before we began descending the cold side of the mountains. There were now no ap-

pearances of ice or frost, and although it was certainly very chilly, the temperature was anything but insupportable. The summit of the ridge at the place of crossing bears the homely designations of Bákalo Sábar, "break-down mule," and Thírghia (?); the more poetical name of Semáilas, "lick-the-sky," which I on my former passage had heard attributed to the summit, being with far less propriety given to the steep but lower side-ridge between the rivers Gomádur and Támmie.

After crossing the ridge, we descended by our former road as far the station on Mount Goéba, from whence we turned off westward, crossing Mount Semáilas, and reaching by sunset the bank of a small stream called Gult, forming the upper course of the Tájatiel, where, in the vicinity of the village of Tiéf, we encamped in the open air. The cause of our making this circuit was that the direct road was said to be infested with freebooters. On the way down we were overtaken by a heavy shower of rain, which on the summit of the range assumed the form of hail, as we could perceive from below. On inquiring as to the existence and denominations of the various natural products of extreme cold, I was given the following information:—Hail, which sometimes falls (they say) in stones as large as one's fist, is known by the name of "béredo," the title by which I have heard every species of frost designated; or more specifically "shifá-béredo." Ice is called "wurch," the literal meaning of which is "frost;" a debtera, or scribe, told me that its more correct name is "askhatéa." Hoar-frost is styled "bitten-wurch." I have made repeated inquiries after snow, but I cannot find that it has any existence in this country—that is, within the peninsula of Gójam, to which alone the foregoing details are intended to apply.

I find in Arrowsmith's map of Nubia and Abyssinia the name "Gult" placed against a river in the south of the peninsula, where it certainly has no existence. The "Tzul," too, is a river of Miécha (Maitsha), near the upper bridge. If in addition to these the "Bahr el Abiad" be meant for the A'bea, which I shall subsequently have occasion to mention, the whole of the rivers of the peninsula shown in that map will have been identified, although they have been (I know not on what authority) most strangely misplaced. On inquiry I find that Hádasha, which appears in the maps as the name of a province, is that of a town situate below (E.) of Karáneo, between the Sáddie and Támmie, in the same way as Shígíe is between the latter river and the Azwari.

23rd.—Leaving our station of last night, we continued along the ridge separating the basins of the rivers Tájatiel and Sáddie, till, just before reaching Chábba, we fell into our former road, along which we proceeded to Móta. It was my intention

on arriving here to proceed on this side of the river to the upper (Miécha) bridge, and to cross by it into Biégemider; but, in the unsettled state of this country, it is seldom that one can carry out one's arrangements as first formed. On reaching Móta, I learned that the troops of the Dejasmaches were ravaging the country between there and Miécha, as a punishment to the inhabitants for having killed a governor lately sent among them; so that the road was impassable. I waited therefore at Móta whilst I despatched a messenger to Dejach Góshu, asking for an escort; but he sent me the answer that I could not go through the country westward, but must cross the river in this direction; and he gave orders to the Shums of the frontier to see me and my baggage, &c. safely into Biégemider. From Móta the summit of Mount Lijámbera is just visible in the distance bearing W., and Amidámit before it bearing N. 85° W.

27th.—Whilst waiting for the return of my messenger, I made inquiries as to the precise locality in which the cháat-tree was to be met with; and was informed that it grows in the valley of the river A'bea, at some little distance to the westward of Móta, and in yet greater quantities in that of the Sáddee, in the opposite direction. I preferred descending towards the A'bea, as being more distant, and enabling me therefore to see more of the country, particularly in that direction in which from circumstances I was prevented from going farther. A ride of about two hours brought me to the precipitous brink of the small river Maitamákkó, an affluent of the A'bea, down the side of which my guide said the tree in question was to be found. He descended alone, and soon returned with the intelligence that he had met with several trees below, but that it would not be practicable for me, *in shoes*, to reach them. A single one was, however, growing but a short way down the side, and this with some little difficulty I managed to reach. This specimen was a tree of nearly, if not quite, 20 feet in height, with a stem of about 3 inches in diameter. The flowers, which had been in great plenty, were unfortunately but lately over, and the seeds were not yet come to maturity. I took a few sprigs from the tree with the seeds just as they were. I was informed that the flower is white, resembling in general appearance the Abyssinian rose, but very much smaller in size, and growing in thick clusters, as is indeed evinced by the seeds. It was stated by my guide, and confirmed by several persons in Móta, that there is no *red* variety (as I had been informed at Mártola Máriam); and when I told the former that the stems of the specimens I had previously seen were red, whilst the present ones were white, he said it was merely the young wood that is of that colour; and he descended again to the tree and brought me a sprig, the colour of which was precisely

that of the former specimens. Beyond the A'bea the country is Tzalálo; and above this, to the S.W., Kóllela. Beyond Tzalálo is Ibába, which extends as far as the bridge. Beyond the bridge westward is Miécha.

March 4th.—This being the day, weekly, on which the Móta merchants frequenting the market of I'sti, in Biégemider, cross the Abai, I proceeded northward down to the river in their company and that of several merchants going to Gondar. They took with them the articles already mentioned, as likewise a number of swords, the manufacture of Móta, which enjoys great celebrity in this respect. I was strongly recommended by the governor of Móta to the care of the principal merchant of that place, who was going to Gondar; and orders were given to the people by the river to see me and my servants, mules and luggage, safely across. It will give the best idea of what a "principal" merchant in this country means, by describing the venture on the present occasion of Gébra-Hánna Nórekh. It consisted of 15 ass-loads of coffee, each of 200 lbs. weight, ten horses, and five mules, all destined for sale at Gondar. The proceeds were, I was informed, to be invested in red and blue cotton-cloth, the threads of which, being unravelled, are wove into the borders of the cloths of native manufacture. We descended to the river by the road by which I visited it four months ago. The river had now fallen so as to expose to view the ruins of the centre arch, which lie in the stream. The passage of the goods and baggage was effected by means of ropes from the rocks on each side: when the river is swollen, it takes place above on the bridge. The people crossed by swimming; those who did not know how to swim being supported on a bundle of reeds, which a swimmer pushed on. I saw one lad slung across by means of a rope, without touching the water, which is the usual means of passage when the river is high. The passage of my luggage, mules, and myself, was effected under very different circumstances to that of last year, under the care of Marie Sábaru. Everything was perfectly orderly, and not an article damaged or missing. I was anxious to reward the people with a dollar, but was reminded by my majordomo, Wálda Georgis, of the lowness of my funds. To be reminded I did not need: I mean, that he put a veto on an act of liberality which he most truly said my means did not permit of. A single *amole* which I had remaining, a second that I borrowed from one of the merchants, three needles, and a little medicine, were all therefore that I gave them for their pains and care; for which I received their thanks and good wishes! We now ascended the steep banks of the river on the N. or Biégemider side, in the district of A'ndabiet; after which we continued northward, along the plain country above, till we reached the almost

dry bed of a small stream called I'slamwáns, where we encamped for the night. The country on this side of the river, which seems almost without population, is thus far much inferior to that to the S., being quite destitute of wood, and the beds of several small torrents, crossed on the way, being almost devoid of water.

5th.—To-day the road proceeded north-eastward, slightly rising over an undulating country, at first of a similar character to that of yesterday, but towards the end somewhat improving. After about $3\frac{1}{2}$ hours of easy travelling we reached our station for the night in the valley of the river Góta, near to Shímie, until lately the residence of the governor of A'udabiet, and still the station for receiving the duties on this side of the river. The present governor has moved to Mósha, which place we passed about 2 miles to our left, near the middle of our day's journey.

6th.—Proceeded still northward, and in about an hour after leaving our resting-place of yesterday we parted from our companions going to the markets of Isti and Sókota, they taking their way up the mountains to the right, whilst we, in company with the merchants of Máhdera Máriam and Gondar, continued northward up the valley of the Góta, which river we crossed four times before we turned off from it north-westward. The ascent up the valley of this river, and subsequently up that of a small tributary of it, was gradual, till in about four hours we reached the summit, coming to an extensive view over the basin of the river Gumára, flowing into Lake Tzána. The elevation of the highest point I estimate at about 8000 feet. Máhdera Máriam was now visible, bearing N. 5° W., and Débra Tábor N. 20° E. The descent of the mountain on the northern side is for a short distance extremely steep, which has occasioned the trivial name given to the ridge of Chámma Máragfia, "take off shoes."* A descent of little more than two hours brought us to the river Dábbir Gumára, one of the affluents of the principal river of the latter name, where we dined and rested; afterwards continuing our course to Máhdera Máriam (the Débra Máriam of the maps), a celebrated convent and mercantile town, placed most imposingly on an immense mass of rock, being the termination of a ridge from the eastward. The ascent to the place is extremely steep and difficult; and the slightest assistance of art would render it, as a fortress, next to impregnable. Shortly before reaching this town we crossed the river Matarái, on the farther side of which we parted from the merchants in our company, who encamped in the plain below. The next station of those proceeding to Gondar, they said, would be by the river Rēb.

7th.—Having made up my mind not to leave the country

* Literally, "the taking off of shoes."

without visiting the upper bridge on the Abáí, I lost no time in procuring a guide to accompany me thither. In Biégemider this bridge is usually called the *lower* one, and that of Andabiet the upper; which misnomer is not at all unnatural when we consider that the road to the former is down-hill, following the course first of the streams which flow into Lake Tzána, and afterwards of those which join the Abáí itself; whereas the road to the Andabiet bridge is all the way up-hill till the summit of Chámma Máragfia is reached. In the course of to-day's journey, the direction of which was W.S.W., we crossed the Dábbir Gumára, with its tributaries the Mataráí and I'mbita, as also the Fógara, which (if I am rightly informed) has its course separately to Lake Tzána; and then passing over a tract of nearly flat country, the elevation of which is probably 6000 feet, we came to the river Kwashénni, having its course in the opposite direction and joining the Gébati, which flows directly into the Abáí. Shortly after crossing the Kwashénni we came to the village Wandagátti, where we stopped for the night.

8th.—A ride of about 2½ hours, nearly S.W., brought us to the village of Zamócha, the residence of the warden of the bridge, situate at a short distance to the eastward of the river A'lata. From him having obtained a man, I descended to the river, where there was at first some difficulty as to my approaching the bridge, the toll-collectors of Dejach Biru, who sat on this side with those of the Ras, not permitting me to pass till I had explained that I had just come from Gojam with the Dejazmach's permission, and had no intention of crossing. The bridge consists of a single arch springing at once from the rocks on the Biégemider side, but on that of Miécha having seven or eight (I believe the latter number) of small approach arches. It has a parapet on each side (now in many parts broken down) of a yard in height and about 2 feet in thickness, and its breadth, inclusive of the parapet, is 5 yards. I should say without question that this bridge is the work of a different period from that of the lower one, it being of much inferior workmanship and most irregularly built; in fact, without any attempt at symmetry, and apparently without any plan. There are the remains of a gate on the N. side; I could perceive nothing of the kind on the other; but the whole structure is in so dilapidated a state, that one is not able to speak positively as to its former existence or not. The direction of the bridge, as near as its irregular line would allow me to determine, is S.E. by E., the approach on the Miécha side bending round a little to the southward. The river runs here with great violence through a deep fissure in the rock, so narrow that just above the bridge it may be leaped over: I should say it cannot be more than 2 yards in width. The rapids extend apparently from

the bridge upwards, as far as a cataract marked in the maps as the "Cataract of A'laia," which may be about half a mile off. There is no approach to it directly from the bridge, and I was told it was "a long way off," and in fact not visible on this side of the river. As to the opposite side, it was not permitted me to go there, and when I returned from my inspection of the bridge, I found the guide whom I had engaged at Máhdera Mariam made a prisoner by Dejach Biru's people. The precise reason for this I could not make out, but I believe it was mainly in the hope of extorting money from me; since, when I said that being a stranger I could not and would not interfere, and rode off without him, he was soon set free and came running after me. I returned therefore to Zamócha, where, on questioning the people as to the waterfall, I found that the information given me below was incorrect; that it is quite near the bridge, and approachable on this side. I accordingly descended again to the river (but without approaching the bridge), and was richly rewarded for so doing by the sight, which is perfectly unique. The river, gliding through a fine grassy plain between a line of dark foliage on each side, its smooth surface being disturbed by only a few ripples—for so some slight rapids appear in the distance—falls at once perpendicularly over the ledge of the rock which crosses its course, and is lost to sight, whilst in its place arise volumes of vapour having precisely the appearance of smoke: hence the highly expressive and poetical name given to the cataract by the inhabitants of Tis Esat, or "the smoke of fire." I was told that by descending into the deep ravine into which the river falls a view from below might be obtained; but, independently of its being late, which rendered my immediate return expedient, I felt no inclination to dispel the charm which the view above leaves on the imagination by going to see a common waterfall.* I therefore returned to Zamócha, where, it being too late to go farther, I stopped for the night. On my inquiring of the people as to the height of the fall, one said it was 100 cubits, another only 50; but after discussing the point for some time, they came to the unanimous conclusion that it must be at least 60 or 70 cubits; which taking the cubit—the length from the elbow to the tip of the middle finger—at 18 inches, will be about 100 feet. The noise of the fall is heard at the distance of at least a quarter of a mile. Between this point of the course of the Abáï and that at the Andabiet bridge there is a succession of falls and rapids, so as to occasion, in a distance of less than 30 miles, a difference

* See Bruce's account of this waterfall in his 'Travels,' vol. iii. p. 425. Ruppell visited the bridge (see his 'Travels,' vol. ii. p. 212), but did not go up to the cataract.

of elevation in the bed of the river of at least 2000 feet; a phenomenon common to all the rivers of Abyssinia.

9th.—Leaving Zamócha very early this morning, a forced march till evening brought us back to Máhdera Mariam.

12th.—I remained at Máhdera Mariam over the Saturday's weekly market, in order to inquire as to the state of the country beyond Antálo, it being reported unsafe to travel through, but could obtain no definite information on the subject. Nevertheless I this morning left for Débra Tábor on my way north-eastward, it being my determination not to go the so oft trodden road of Dembea and Sémien, if it could by any means be avoided. The road is very irregular, winding up the mountains and crossing the rivers Sébat-Wódem-Gumára and Sénsaho-Gumára, the latter being the principal stream of those bearing the common name of Gumára, which have their rise in the high range of Mount Gúna, bounding the basin of Lake Tzána to the E., or perhaps more correctly the S.E. The country, as far as I have seen it, is but scantily peopled and little cultivated: to the westward, however, the low flat country towards Lake Tzána is said to be extremely fertile. Débra Tábor, where we arrived soon after noon, was founded by Ras Gúksa, the grandfather of the present Ras Ali, who made the title hereditary in his family, and whose remains lie buried in the church of "Yesus," situate on an elevation of the ridge between the basins of the Gumára and Rëb, which elevation is properly Débra Tábor, the capital of that name being placed on its skirt to the north-eastward. This town was last year burned down by Dejach Biru, shortly after my arrival in Gojam, and is not yet rebuilt; it consisting for the greater part of a rude assemblage of mere huts. On announcing myself at the palace, and stating, in answer to numerous inquiries, from whence I came, where I was going, &c. &c., I was not allowed the honour of an interview, the Ras (as I was told) being apprehensive that I might have brought "medicine" from his enemy Biru Goshu. But his curiosity led him, notwithstanding, to come out and view me from a distance, and he even went so far as to send for my cap to look at. He readily consented, however, to my journey through his country, and gave me a guide to Ebenat, the residence of Dejach A'bbie, ordering me a supply of food until my departure. From Débra Tábor, Lalibala was said to bear N. 80° E.; the road thither, gentle travelling, is as follows:—Mókeria, Cháat Waha, Dibúkko, then cross the Tákkazie to Lalibala. Beyond this one day's journey farther to Imerehá. Mount Gúna bore from hence S.E. Beyond it are Wádela and Daunt; between which and Ambára the river Báshilo is the boundary. The head of the Báshilo, said to bear E.S.E. from

Débra Tábor. Isti, S. 15° E., about 7 miles; Yefag, N. 60° W. 1 day's journey; Mount Melza, N. 20° E.

14th.—This morning I left Débra Tábor without holding any further communication with the Ras. We now descended into the valley of the Rëb, crossing on the way the Gibúda, a tributary of the former, nearly of the same size as the principal river of the name of Gumára. The Rëb itself is of larger size than any of the Gumáras, being at the ford at least 10 yards in width, but shallow—that is, less than a foot in depth. Lower down, however, when all the latter rivers have united and formed one stream, the Gumára is said to become a more considerable river than the other. On crossing the Rëb we entered the district of Ebenat, and began gently ascending the mountain towards the residence of the governor, which bears the same name. In about 3 hours we reached the summit, when we came to a plain on the N. side of Mount Melza, a cross ridge of the range of mountains forming the watershed between Lake Tzána and the river Tákkazie. The elevation of this plain I cannot estimate at much, if anything, above 7000 feet. Crossing it north-westward, we, towards evening, approached Ebenat; but it not being considered proper for me to make my appearance before the governor so late in the day, we turned off to a small village called Gútoch, situate close to the first break in the ground towards the Tákkazie, and near to a small brook named Sánkisa, the waters of which descend towards that river. Beyond Débra Tábor the country improves somewhat in its character and appearance, being, although still mountainous, of more even surface and possessing more population and cultivation. From Gútoch Mount Melza bore S. 35° E.

15th.—Ebenat, whither we went up this morning, is a place of no size, consisting merely of the residences of the Dejazmach and his family, with a few huts for their attendants. The market is, however, very considerable—lasting two days, Friday and Saturday—it being the point where the merchants of Gojam, &c. meet those from Sókota bringing salt, for which they give cloths, coffee, and a large number of cattle, oxen, and heifers brought from Gúdera. Farther than Ebenat they do not go eastward, this being a cross-road. The two grand mercantile lines from N. to S. through Abyssinia are, the one by Adowa and Góndar (or Dérta), and the other by Antálo and Sókota to Warrabémáno; besides which, as I have learned since leaving Máhdera Mariam, there exists a middle road from thence by the way of Hádesha in Beléssa (Belessen) and Témbien, which is sometimes taken by the Baso merchants going to the coast. The governor of Ebenat is a Mohammedan; and many of the inhabitants of this country are of the same religion. Islamism is in fact making

strides over Abyssinia (as it is through the Galla countries to the S.), numbers of the Christians continually passing over to it. I am now writing (at Ebenat), whilst in my hut chatting with my servants are two of their relations, natives of Gojam, settled here, both of whom have become Moslems. Mount Guna bore S.S.E.; Mount Melza, S 55° E.; Mount Debra Tabor, S. 10° W.

21st.—I remained at Ebenat over the market, intending to leave for Sôkota with the merchants returning thither on Saturday evening. But the two servants whom Wâlda Georgis had engaged, and who had thus far conducted themselves to my entire satisfaction, having here fallen in with several friends and acquaintances, merchants from Yaush, were by them ill-advised and frightened, and on the Saturday morning, when preparations were being commenced for our journey, they "struck". The one, having obtained from me a dollar "to send home to his family," left without hinting his intention to any one, and was not to be found; the other, after refusing all day to accompany me farther, was at length in the evening induced by Wâlda Georgis (whose relation he is) to go on with him. But it was now too late, for the merchants for Sôkota had left; so that we were compelled to wait till we could find another opportunity of proceeding on our journey. This occurred to-day, when the Dejazmach (who had previously refused to furnish me with a guide) being on the point of proceeding to Debra Tabor, whither he had been summoned by the Ras, in consequence of reports of the hostile approach of Dejach Biru Goshu, I was forwarded by him to Nikwâra, the residence of Fitaurari Siyûm, through the petty *shums* of the intervening country, in the same way that I was "passed" through Damot in December and January last. On leaving Ebenat this morning, the road lay at first for a short distance N. by E. through a rich cultivated valley, when it began ascending the mountains north-eastward, crossing a ridge of the name of Jîrzu to the N. of the river Tékken, the ridge of Mëlza (already mentioned) being to the S., and both being portions of the range bounding the Tákkazie to the westward, of which Amba Hai and the mountains of Sémien are also part. The summit of the ridge crossed by me, which I rate at probably 8000 feet above the sea, is covered with olive-trees in such numbers as to form complete woods. This tree is common throughout Abyssinia, but I never met with it in such abundance as here. After continuing over the tolerably level summit for some time, we reached the village of Zibákwaha, overlooking the river Tékken, where we put up for the night. From Zibákwaha, Zoz-amba, a remarkable flat-topped isolated mountain, bore N. 20° E. beyond the river Nili. Lalibala said to bear from hence S. 60° E.

22nd.—We did not leave Zibákwaha till the afternoon, as we were told that we could not reach Nikwára to-day. The real reason was, however, that our host of last night was unwilling to see me farther than the neighbouring village of A'derseg, distant less than a couple of hours' ride, its bearing being about N.E. of our last station.

23rd.—Notwithstanding what we had been told of the distance of Nikwára, we reached it this morning before noon, our course being about E.S.E. Shortly after leaving A'derseg we crossed the river Tékken, forming the boundary of the district of Ebenat. Its bed is about 10 yards in width, but in the present season it is for the most part dry, there being merely two shallow streams, of 2 yards and 1 yard in breadth, running through it. The country of Biégemider, from the rise of the basin of Lake Tzána eastward, is a mass of mountains intersected by deep valleys, getting more barren and desolate the farther one proceeds. In Ebenat they said that the country was formerly peopled, and at Zibákwaha they pointed out to me the sites of several villages, the inhabitants of which, they said, have either died off or removed in consequence of the oppression of the present governor. Whatever may be the truth of this statement, it is quite certain that this is not the sole nor even the principal reason, since after passing the limits of the Dejazmach's jurisdiction, so far from finding improvement, the country appeared to me to get worse. It is the scarcity of water that is the main cause of its deserted state. At one of the villages on the road, where we stopped to change our guide, the distance that the women had to go to fetch water for domestic purposes was quite appalling. In Europe, Biégemider is said to be noted for its fine flocks of sheep, and the name of the country has been derived from the word *bag*, meaning "sheep." But it is only necessary to see the country to be satisfied that it never was and never can be a sheep country. The high Wollo plains to the S.E. are, on the contrary, justly celebrated for their fine breed of long-wooled sheep, the fleeces of which are prized throughout the whole of Abyssinia, being worn over the shoulders by persons even of the highest rank. From Nikwára, Mount Melza bore S. 45° W.; and Lalibala was said to bear S. 75° E.

24th.—Fitaaurari Siyum being at A'zwi, a short distance to the E. of Nikwára, we left this morning for that place, which we reached by noon. The barren mountainous country is so far from improving, that during a ride of nearly 5 hours I did not pass a single village, or cross or come within sight of a single brook or spring. From A'zwi, Zoz-amba bore N. 45° E.; and the valley of the Merri, between Lasta and Waag, N. 85° E.; Mount

Melza, S. 65° W.; Mount Biála, a high mountain mass above Sókota, N. 75° E.; Lalíbalá said to bear S. 65° E., 4 days' journey, or 3 quick travelling.

27th.—Yesterday, on Fitaaurari Siyum's leaving for Nikwára, he recommended me to the care of his brother Aito Háilu, whom I was to accompany across the Tákkazie. The latter accompanied the Fitaaurari a part of his way, but returned this morning; and by his direction I removed to the village of Dugaláiba, about a mile lower down, he having taken up there his quarters for the day. At Dugaláiba I was informed that Tzelásferri and Mékkina are two A'mbas in Lasta, on the opposite sides of the river Tákkazie, the former being beyond the river towards Wádela; the latter on this side towards Lalíbalá.* The head of the Tákkazie is less than a day's journey beyond Lalíbalá. To Lalíbalá from Dugaláiba is three days' slow travelling; quick, it may be reached in 2 days. The first day Búgana in Lásta is reached; the second day Lalíbalá. The head of the Tákkazie is in the district of Gedán, beyond which is A'ngot. All the opposite E. side of the Tákkazie, from Waag to Gedán, is Lasta.

28th.—This morning early we left Dugaláiba: our road kept descending north-eastward, at the end very steep, till we again came to the river Tékken, down the bed of which we continued, going now more eastward, for nearly 2 hours, incessantly crossing the small stream: if I counted right, it was 36 times in all. On reaching the junction of this river with the Tákkazie, we stopped to rest during the heat of the day, Aito Háilu at the same time superintending the collection of duty from a numerous party of salt-merchants passing into Biégemider from Sókota. In the afternoon we continued our journey, crossing the Tákkazie and entering Lasta. Our course was for about half-an-hour N.E. down the bed of the river, the stream of which we crossed three times before we left it. From this fact alone it will be evident that the river is of no great size here. At the places where we entered it it was some 20 yards wide, with a depth of about a foot, running briskly, but by no means with violence: at the deeper part of the stream it was less than 10 yards in width, whilst the current seemed scarcely to possess motion. The elevation here of the bed of the river above the ocean must, I think, be about 4000 feet. Since the destruction of my thermometer I have no means of deciding as to heights beyond my personal judgment grounded on past experience: no certain dependence is therefore to be placed on my estimates; nevertheless they may not be

* This is totally irreconcilable with the information given by Mr. Salt in his 'Voyage to Abyssinia,' p. 279, on the authority of Pearce.

altogether without value as rough approximations. We continued down the Takkazie till we reached the river Mérrí, an affluent of the former, of about the same size as the Tékkén, along the side of which we ascended, and then crossing it we began a steep ascent to the high land of Lasta. It was near sunset when we reached Zélesa, the residence of Aito Háilu, who is the Shum of A'bam, a subdivision of Dáhana, as the country to the N. of the Mérrí is called: beyond that river to the southward is Búguna. These two districts, together with those of Sókota or Waag Proper, Wóffa, and Bóra, form the dominions of the Waag Shum—to call him Dejazmach would be an insult—who is one of the most important chiefs of Abyssinia, and whose territories are far more extensive than one can have any idea of from the existing maps. The tradition of Lasta, which differs widely from that of the rest of Abyssinia given in the histories of this country, says that Ménilek, the son of Solomon, king of Israel, accompanied by his sister Saloméa and her son Sirak, entered Abyssinia from the E., beyond the country of the Raia or A'zabo Gallas (*i. e.* from Azab or Sába), and that his original settlement was in Zóbul, before Ambasel (Amba Israel) was made the seat of government: and further, that Zóbul is the country in which King Teóderos (Theodore) is to reign. This king is no other than Nakwetalaáb, the last reigning monarch of the native dynasty of Lasta (claiming descent from Sirak, and known in the histories as the house of Zague), who, after ruling Abyssinia for 36 years, resigned the sceptre to Icon Amlac, the progenitor of the present imperial family, and who is said to be still alive and wandering about between Jerusalem and Zóbul, in expectation of the time when his second reign—which is to be a sort of millennium—is to commence. According to the same tradition, the appropriation of one-third of the Ethiopian empire to the family of Nakwetalaáb, was not made by the monk Tekla Háimanot, as stated in the histories (see Bruce, vol. i. p. 533), but by King Solomon himself, who divided the empire between his son and daughter, giving two-thirds to Ménilek, whom he made king, and one-third to Sirak, Saloméa's son, whom he appointed Waag Shum (*i. e.* Chief of Waag), with the proviso that on the failure of male issue of Ménilek, the male issue of Sirak should succeed to the imperial throne. The state of the two princes was to be similar, and their rank equal; which is expressed in the Abyssinian proverb:—

‘Wáagshum la wánbār,
Negús la mánbār.’

i. e. the Waagshum to the *wánbār*, and the king to the *mánbār*, the two words being synonymous, and meaning *chair* or *throne*.

Even at the present day, when the empire of Abyssinia exists only in name, the Waag Shum, although in a great measure subjected by the Ras, is not looked upon as a dependent chief bound to pay tribute; whilst the King of Shoa, although virtually an independent sovereign, is considered *the governor of a province*, who does not render tribute simply because the Negús (or his representative the Ras) has not the power to enforce its payment, but who, if the empire were reinstated, would do so as formerly, which the Waag Shum never did and never would. It is to be remarked that neither Sábela Salássie, Negús of Shoa, Goshu Záudie, Dejazmach of Gojam and Damot, Gehanécho, Thato of Kaffa, nor any other of the numerous descendants of the imperial family *in the female line*, has the slightest pretensions to succeed, now or hereafter, to the imperial throne, the right to which is subject to the same law as that regulating the descent of the crown of Israel—the power of selection among the *males* of the royal family; but with total exclusion of all claiming descent only through females. From Zelesa, the head of the river Mérrí bore S. 75° E.; Nágala (high country), S. 20° W.; Aunánur, an Amba, with a convent of that name thereon, in Mékiet, S. 5° W.; the high country of Wádeia, stretching from S. to S. 30° E.; the river Bérberi-wans is between Aunánur and Wádela, and joins the Tákkazie. Lalibala, said to bear S. 50° E., 3 days' journey slow, or 2 days' quick travelling.

30th.—I remained a day at Zélesa, and this morning proceeded on my journey eastward towards Sókota, ascending the mountains between the valley of the Mérrí and that of the Sábba, a smaller affluent of the Tákkazie, the summit bearing the name of Nárbilu; and in about 3 hours we reached the high level country—the elevation of which I estimate at from 6500 to 7000 feet—over which we continued E. a couple of hours longer, when we came to Gor-ámba, the residence of a relative of my late host. The language of the inhabitants of the valley of the Tákkazie and of Waag generally is the A'gau—the native name is Hbáméra—in a dialect not near so harsh as that of A'gaumider, and to which (remarkably enough) the language of the Faláshas of the latter country bears a closer resemblance than it does to that of the people among whom they are now residing. At Gor-ámba the position of Lalibala was visible, (which, at all other stations, it had not been,) bearing S. 40° E., 2 days' journey, or perhaps 30 miles. Tzelásferri is beyond Lalibala, about half a day's journey; Mékkina nearer than Tzelásferri to Lalibala, and the Tákkazie runs between them. Mékkina is the same as the head of the river. The road from Débra Tábor to Lalibala is good, being *plain*. The head of the Bashilo is a long way off, said to bear

about S.S.E. of Gor-ám̃ba. At this place were further visible Mount Guna, bearing S. 35° W., and Mount Biála, N. 80° E.

31st.—Beyond Gor-ám̃ba the plain country ceases, and the road continues winding, on a general bearing of E.N.E., along the summit of the ridge—sometimes only a few yards in width—between the valleys of the Sábbaha and the Mízrib, a tributary of the Mérrí. After about 2 hours there is another flat, but of no very great extent, and then again a narrow ridge between the Mízrib and the A'rri, a tributary of the Tákkazie. The mountain-ridge thus traversed bears the name of Amdawárk; and I am told that the whole of Lasta is a succession of ridges and valleys like this. The flat summits of the mountain, which, being nearly the same throughout, give one at a distance the idea of an uninterrupted plain like Gojam, may be estimated to be throughout somewhere about the height last mentioned. In 6 hours after leaving Gor-ám̃ba we stopped at Síkuna, formerly said to have been a convent of celebrity, but now reduced to a few huts, situate under the precipitous face of the rocks bounding the basin of the Arri. From Síkuna the summit of Mount Biála bears N. 85° E., and Mount Gazgíbla, the head of the river Mérrí, S. 70° E.

April 1st.—It was my desire to reach this evening Máskalo, the residence of the Dejasmach of Dáhana (or Dáhana Shum, as he is called here), and therefore I was off early from Síkuna. But on reaching Kitára, the frontier-post of Waag Proper, distant about 5 miles E. by N., I was stopped by the "custom-house officers," and, in spite of all I could say or do, detained until the Dáhana Shum's pleasure was known, for which purpose Wálda Georgis and a servant of Aito Háilu, who had accompanied us, were despatched to Máskalo. I in the meanwhile remained encamped in a fine level plain, forming a portion of the ridge along which our road still continued, whilst my detainers were employed in collecting the duty from the salt-merchants arrived to-day from Sókota; and in the evening I was taken by the Shum to the small village of Katzemán, there to wait the return of our messengers.

3rd.—Yesterday morning Wálda Georgis returned with orders from the Dáhana Shum that I should instantly be forwarded with my luggage, &c. without molestation: however, it was not till this morning that I started. The road continued eastward over the mountains, which now form the southern boundary of the basin, first of the Arri, and afterwards of the Télla, another tributary of the Tákkazie, till in rather more than 6 hours we reached Máskalo—properly Máskala Krístos—a town with a convent at the foot of Mount Biála, which the present Dáhana Shum has chosen for his residence, although not within his government, in order that

he may be near Sókota, the capital of his brother the Waag Shum. Mount Biála (which is sometimes called Mount Máskalo) is a prominent portion of a large mountain-range which apparently descends from the system in which the Tákkazie has its source, and which range, running northward or north-westward, separates the basin of the upper course of that river from that of the Tzelári, a river of which I shall have occasion to speak in the sequel. The summit of Mount Biála bears from Máskalo S. 75° E.

4th.—Leaving Máskalo this morning in company with the Dáhana Shum, who fortunately was going to Sókota on business, a sharp ride of about 5 hours N.E. by N. brought us to the latter place. The road skirts the foot of Mount Biála, crossing spurs from it, and then traversing a tolerably level country it descends to the capital. Sókota is a place of considerable size, but is so very straggling that it is not easy to form a definite idea on the subject. It has a large market, held on Tuesday and Wednesday weekly, which is frequented by the merchants of the south and west, this place being the grand centre of the salt-trade, the Tigre merchants coming thus far only, and then returning. By walking about half a mile eastward from the town to the summit of a low ridge of mountains, I obtained a view of the country to the E. beyond the river Tzelári, some portions of which were pointed out to me by a person who accompanied me. A'shangi (this being the name of a district), distant 2 days' journey, bears from Sókota about S. 80° E. The first day's journey is up the mountains to Záfía in Wófla, bearing S. 60° E. The lake of A'shangi is between A'shangi and Wófla; and Lake Máchakh (the smaller lake of A'shangi) is in Wófla, being to the S. of the large one. The rivers of A'shangi go to Ráia, which is below the former; beyond it being Zóbul, and then Adál. A'shangi belongs to Tigre, and Wófla to Waag, but the language of both is that of Tigre: the inhabitants are Mohammedans. The Ráia Gallas are generally pagans, but there are Mohammedans among them. Further, from this spot Mount Adamahónni, in the district of Ebállí in Tigre, bore N. 70° E., below it to the left being Bóra. The valley of the river Sássela, coming from Wófla and joining the Tzelári, S. 75° E. Mount Biála, S. 15° W.; Warrabémáno, S. 15° E.

6th.—I had fully calculated on a detention at Sókota of several days. On applying, however, to the Waag Shum for a guide to Tigre, he readily gave me one, and I left this morning early. My road of to-day was travelled for the most part in company with a numerous party of Tigre merchants, who had brought *ámole* to Sókota, and were now returning with cloths, mules, and

oxen. They had left over-night, encamping by the small river Mai Lomi, a tributary (I believe) of the Tzelári, along which the road descended N. for about an hour, and then leaving it, it ascended, keeping on N. during the whole morning along what appeared to be a ridge of the mountains bounding the Tzelári to the W. Soon after noon we began a sharp descent from this ridge, and came into the dry bed of the river Shagálu, down which we continued till evening, when we came to the Tzelári, which we crossed, and then ascending from it a little way, encamped for the night in the open air. The Tzelári is a river of considerable size, which rising to the eastward of the head of the Tákkazie, receives a large proportion of the waters of Lasta as far as Wóffa, and being afterwards joined by the Zámra, a river of smaller size rising in Wójjerat, the united stream falls into the Tákkazie, which by this accession must be fully doubled in size. The country traversed by these rivers is very different from the rest of Abyssinia, being for the most part an almost uncultivated, desert, sandy tract, of much inferior elevation, and almost entirely devoid of water; the so-called rivers being mere *wadies*, which are filled with water only during the rainy season. The Shagálu, down the bed of which we descended to-day, has a great resemblance to the Wady Kéllu on the road from Tajúrrah to Shoa; with this difference, however, that the latter contained good water along its whole extent, whilst during $2\frac{1}{2}$ hours' march down the bed of the former we came to only one spring and well, the water of which was filthy. The later season of the year has perhaps something to do with this. The elevation of the bed of the Tzelári can certainly not exceed 4000 feet. The desert tract thus traversed by this river forms the natural boundary between Lasta and Tigre, as it does between the Agau and Tigre languages. In order to prevent misunderstanding it is proper to remark here that Waag is the name of the northern portion of Lasta, the southern portion being known as Lasta Proper. In Waag itself they repudiate the designation of Lasta, but throughout the rest of Abyssinia both Waag and Lasta Proper pass under the general appellation. It is the same with Gojam. The inhabitants distinguish between Gojam, Damot, Engábsie, &c.; but on this side the Abáí the whole peninsula is styled Gojam. So too, in fact, with Tigre, Amhara, and Shoa.

7th.—Leaving the Tzelári, the road began ascending gradually northward for more than an hour to Sákka, from whence Mount Biáka was just visible, bearing S. 5° E., and then continued still N. over a level barren country till, in about 3 hours, we reached the Zámra, which forms the frontier between the province of Bóra in Waag and that of Sálowa in Tigre, by the side of which river

we encamped during the heat of the day. The district between the two rivers through which our route lay is not properly Bóra, but Zebád, a dependency of the former, which lies farther to the E. In the afternoon we went on N. for about a couple of hours more, to the village of Fenárwa, where we stopped for the night. At Fenárwa, Mount Adamahónni bore S. 55° E.

8th.—From Fenárwa we continued gradually ascending E.N.E., and then E. by N. towards the high land of Tigre, the country improving by slow degrees, the sandy soil and want of water being opposed to vegetation. In near 6 hours we reached the town of Sámrie, the residence of the governor of Sálowa, where we stopped. From hence Mount Bíala bore S. 15° W., and Mount A'mbera, an isolated peak rising from the *Kolla* (low country) of Tembien, N. 35° W. Sámrie is the salt-market of Tigre, in direct correspondence with Sókota in Lasta, and the difference in the value of *ámole* on the opposite sides of the desert is very marked; here 50 or more going to the dollar, and there only about 40. At Ebenat the number has already decreased to about 30; and on crossing the Abáí only 25 or 20 are obtained, the rate falling as the distance increases. It is not to be imagined that the difference all falls to the merchant: in fact, I have in the course of these pages given more than one instance of the levying of duty on these *ámole* in their passage across the country, which duty forms no unimportant item of the revenue of the native princes and governors.

9th.—Dejach Ubie being in the field against Baalgáda Aráia, a grandson of Ras Wálda Salássie, and being encamped a little way from Antálo, I this morning proceeded to his camp, which I reached after a ride of about 5 hours N.E. by N., the ground continuing to rise gradually till the table-land of Tigre is reached. I had been told that when we arrived here we should find it like Gojam: as yet, however, the difference between the two countries is very marked both to my eyes and to those of my servants, who constantly exclaim (and with perfect truth) that they have not yet seen a country like their own. The grand cause of the superiority of the peninsula of Gojam appears to be, that the elevated mountains in the centre of it collect the waters of the heavens more or less at all seasons of the year, so that the numerous rivers descending from them, although they decrease considerably in the dry season, are never quite dry. The Dejasmach's camp was by the village of Asta, about 4 or 5 miles almost due E. of Antálo, which town is however not visible, it lying, as I was told, just on the other side of some low hills. On arriving in camp I went up to the gate of the Dejasmach's court to announce myself, where I waited some time till the Dejasmach's eunuch came out. After

inquiring as to my country, my journey, &c., he refused to announce me to the Dejasmach, notwithstanding my repeated request, and although I said I required no more from him than I had obtained from the Ras and the other chiefs through whose countries I had passed—a guide. I had therefore no alternative but to return to my baggage, which I had left below; and finding some unoccupied huts in the camp, I took possession of them with my people, and passed the night there. From hence Mount Aláji in Wójjerat bore S. 20° E.; Mount Adamahónni, said to be beyond it, was not visible.

13th.—The following morning I went up to the Dejasmach's, but with no better success than before; so that I returned, leaving Wálda Georgis to negotiate with the eunuch, who on the promise of a dollar—one of my remaining two—engaged to procure from the Dejasmach a guide to Tembien, the direct road to Massówali through Agámie, as also that to A'dowa by Girálta, being rendered impassable by the rebels. To this arrangement I could make no objection; on the contrary, I was rather pleased than otherwise, as the circuitous route enabled me to visit an additional though small tract of *new* country. As to my approaching the Dejasmach, this was utterly denied me, for what reason I am not able to say. But notwithstanding the arrangement made with the eunuch, it was not till this morning that the guide was given me, and in the meanwhile I had to remain in my miserable quarters, and to shift for myself as well as I could. On leaving the camp this morning, the road led north-westward over an almost level country, with the exception of a ridge bounding to the eastward the valley of the small river Durgebáa, a tributary of the Arékwa, which latter stream (I was informed) has its course *separately* to the Tákkazie. After a ride of about 4½ hours we reached the village of Kabári, where the guide, as directed, found us quarters for the night.

14th.—Our journey of to-day was, if anything, less than that of yesterday, owing to the delay and difficulty caused by the constant changing of guides. In about 2½ hours after leaving our resting-place, our course being about N.W., we came to the brink of the valley of the river Gebáa (Gibba), over which we had an extensive view, and down the side of which we now began descending. In about a couple of hours more we were compelled to stop at the village of A'dega Músie, the persons who were now called on to see us across the river into Tembien refusing to take charge of us till the morning. As far as the Gebáa the whole country is Sahárte, a subdivision of Endérta.

15th.—This morning we started long before day-light, and, descending a little way farther, began crossing N. the level plain

through which the Gebáa winds. This river, which like the Arékwa has its course separately to the Tákkazie, is not more than about 6 or 8 yards broad at the ford, and quite shallow. In rather more than 5 hours N.N.W. we reached the town of A'biyad, where we stopped. We were here in view of the high mountains of Semien, stretching from W.S.W. to W., which were, however, but imperfectly seen from their being enveloped in clouds and mist. Mount Ambera in Tembien bore N. 85° W. A'biyad is the principal place of Tembien, and a large market-town.

16th.—The Shum of A'biyad sent a man on with me this morning to the Mohammedan village of Takirákira, about an hour's ride distant to the N., with orders to the Shum there to see me across the river Woréi, the boundary between Tembien and Tigre Proper; but the valley of that river being said to be infested by the Baalgáda's people, he refused to take charge of me. I sent back to A'biyad, but could get no redress; and consequently had only to sit quietly down in Takirákira till I could make some other arrangement. From this place Mount Ambera bore S. 80° W. The mountains of Semien were not visible.

19th.—The Shum of Takirákira had refused to take charge of me, but he was very civil in advising me as to the road, &c., and this morning some of his people leaving for A'dowa and the neighbourhood, he willingly consented that I should accompany them on my own responsibility. Descending north-westward towards the river Woréi, we in about 5½ hours crossed that stream, a good-sized brook, forming at the ford an almost stagnant pool, and then began ascending the valley of the Gwáhero, a tributary of the former. From the Woréi, a ride of about 3 hours, in general bearing about N., brought us to the village of Naráa, where we alighted.

20th.—From this place in about 8 hours I arrived in safety at A'dowa, our course being N. by W. Here I received a most hearty welcome from the European residents, consisting of Mr. Schimper, the German naturalist, and the Abbate de Jacobis, with the other members of the Roman Catholic mission to this country. Nothing could equal the kindness of these gentlemen in supplying me with everything necessary after the privations to which, in consequence of my limited funds, I had unavoidably been subjected, especially during the latter portion of my journey; and they laid me under still further obligations by furnishing me with the means of continuing my journey to the coast. Having thus, through God's mercy, arrived at a place so well known from the number of Europeans who have visited it, my further journey can present nothing of novelty; and I therefore here close my journal.

[While the preceding was going through the press, the following letter was addressed to the Secretary by Dr. Beke.]

“ *Hachney, 17th May, 1844.*

“ Dear Sir,—I had intended to determine my labours at A'dowa, conceiving the country from thence to the coast to be so well known that anything I might do with respect to it would be a work of supererogation; indeed, under this impression, I, on leaving Adowa, discontinued my usual *detailed* notes of my route. I was, in particular, aware that Messrs. Ferret and Galinier have lately surveyed the whole of this country; but on reaching England I find that their map has not yet been made public by the French Government, and that there exists no other in which the road I took can be correctly laid down: I regret therefore that I did not devote the same attention to this portion of Abyssinia as I have given to the rest—still, I am happy to say that my notes are sufficient to enable me to construct a sketch of my route from Adowa to Massowah, which, although it does not pretend to do more than give a general idea of the main features of the country traversed, will, under the circumstances, be not altogether valueless.

“ With respect to this sketch I have to offer the following observations:—

“ Dr. Rüppell, in vol. i. p. xi. of his *Travels in Abyssinia*, says:—‘The stream Assa, which runs by Adowa, and which Salt in his different excursions to Axum in the years 1805 and 1810 often crossed, is made by that traveller to flow north-westward to the Maleb, instead of south-westward to the Takazzé; and both M. Combes and M. v. Katte retain this error, although they went from Adowa to Axum, and consequently likewise crossed the stream.’ And in p. 301 of his second volume, he further says:—‘Here [near Gandufto, north-eastward of Adowa] is the watershed of the basin of the Takazzé to be placed, since all the brooks from Adowa, as far as the heights of Gandufto, flow to the S.W.; whilst, on the other hand, those during the remainder of our road to Halai flow to the N.W.’ In all this I am happy to be able to confirm Dr. Rüppell's statements. The Hássam—as the stream by Adowa is called, not Assa—flows towards the Tákkezé, being, before reaching that river, most probably taken up by the Chómo, which I regard as the lower course of the Gedgeda of Rüppell's map. Further, the position of the watershed is where he places it. My road on leaving Adowa was in the direction of Halai, as far as Yáha, at which place I turned off towards Seráwe. Shortly before reaching Yáha we came to a narrow pass in the dividing heights mentioned by Rüppell, close to which was the head of a small brook running north-eastward, down which we proceeded a little way, when we left it to our right. This is clearly the Yeeha of Bruce (vol. iii. p. 115).

“ Of the streams to the N.E. of the watershed, Dr. Rüppell remarks (vol. ii. p. 301), that ‘only one, of the name of Anguja, is of any importance; and that the whole of the streams lose themselves in a marshy and woody district lying to the N.W., which the Abyssinians call Maleb. He adds that ‘out of this name Europeans have made a stream;’ and he goes on to comment on this ‘supposed’ river Maleb or

Máreb. In this, his assertion of the non-existence of the Máreb as a river, I am bound to say that the learned traveller is mistaken. It is a considerable stream (although in the dry season the water falls very short), forming the boundary between Tigre Proper and Seráwe. Bruce expressly states (vol. iii. p. 115) that it is 'the boundary between Tigre and the [Midre] Bahernagash;' and it is, in fact, the recipient of Rüppell's Anguja—the Anguea of Bruce, or, according to the system of orthography adopted by me, Angûya. Upon this point there can be no mistake. I crossed the Máreb between Hadisáad in Tigre and Gúndet in Seráwe, on the morning of the 30th of April, 1843, being the next day after leaving Yáha. At this time, nearly the close of the dry season, it was full 20 yards in width, with a depth, however, of only a few inches. In justice to Dr. Rüppell, I must 'explain' that his error arises from incorrect information furnished him, since he had no personal opportunity of ascertaining the fact, his road never having been through Seráwe.

"Where the head of the Máreb is, I will not attempt to decide. If MM. Combes and Tamisier and v. Katte are correct in what they say respecting it—their statements are nevertheless not at all clear—it must be far to the N.: and it is to be remarked that Bruce, apparently on the authority of Poncet, places it near Dobarwa. Should this really be the case, I must before quitting Seráwe have crossed the Máreb a second time in the upper part of its course. My attention, however, not being at the time directed to the subject, for the reasons already stated, I confess that I made no inquiries respecting it. But I well recollect that just before reaching Gura (the Gella Guro of the maps) I crossed a small brook, which, to the best of my recollection, ran to the south; and my Abyssinian servant, whom I have questioned on the subject, speaks quite positively to such being the case. The position of this brook corresponds with the upper course of the Máreb of Bruce, as well as of Combes and Tamisier and of v. Katte.

"After quitting the table-land of Seráwe at Gura, I descended from Kaiyakhór to Massówah by a gradual and easy road, well watered, and occupying two days and a half, very gentle travelling. This is so much superior to the steep way up the Taranta, that it is now generally chosen by Europeans; and another important advantage is gained by taking it, which is, that Arkiko is avoided, together with all the annoyances and extortions to which the traveller used there to be exposed.

"I am, dear Sir,

"Yours most faithfully,

"CHARLES T. BEKE."

APPENDIX TO DR. BEKE'S ROUTES IN ABYSSINIA.

I.—OBSERVATIONS FOR LATITUDE AND ELEVATION, 1841-43.

(Continued from Vol. XII., p. 101.)

Date.	Place of Observation.	Meridian Altitude.	Water Boiled.	External Temp.	Remarks.
1841.					
Sept. 29	Ankober . . .	—	196 $\frac{1}{2}$	62	
Oct. 13	Angolalla . . .	—	196 $\frac{1}{2}$	71	
20	Dey . . .	Fomalhaut	99 22 30	197 $\frac{1}{2}$	66 Doubtful.
21	Ditto . . .	Fomalhaut	99 30 0		
22	Yáwalo . . .	(lo. li.	114 52 30	198	69
23	Wála . . .	(lo. li.	127 35 30		
24	Ditto . . .	—	126 20 30	198 $\frac{1}{2}$	69
26	Angórcha . . .	—	125 9 45		
27	Ditto . . .	—	124 17 0	198 $\frac{1}{2}$	69
29	Ditto . . .	—	122 54 15		
30	Ditto . . .	—	122 16 45	198 $\frac{1}{2}$	69
31	Ditto . . .	—	121 46 0		
Nov. 1	Ditto . . .	—	120 53 0	196 $\frac{1}{2}$	68 } Doubtful.
2	Gézar . . .	—	120 41 0		
3	Ditto . . .	—	120 56 30	196 $\frac{1}{2}$	68
5	Wogiddi . . .	—	128 24 30		
6	Ditto . . .	—	127 46 30	196 $\frac{1}{2}$	60
7	Ditto . . .	—	127 12 45		
10	Lélla . . .	—	—	199 $\frac{1}{2}$	72
13	Selakálla . . .	—	123 11 30	198 $\frac{1}{2}$	64
15	Ditto . . .	—	122 10 0		
19	Ditto . . .	—	120 14 45	198 $\frac{1}{2}$	65
24	R. Abai (Shebal) . . .	—	—	206 $\frac{1}{2}$	78 10 feet above the stream.
25	Shebal (Galla village) . . .	—	—	199 $\frac{1}{2}$	62
26	Shebal (Bataa's house) . . .	—	116 51 0	—	See Dec. 12, 1842.
28	Bichana . . .	—	115 57 30	—	
Dec. 3	Dima . . .	—	114 18 30	199 $\frac{1}{2}$	68
7	Ditto . . .	—	113 13 0		
8	Ditto . . .	—	113 4 30	198 $\frac{1}{2}$	62
9	Ditto . . .	—	112 51 0		
10	Ditto . . .	—	112 40 15	198 $\frac{1}{2}$	
1842.					
Jan. 16	Ditto . . .	—	116 36 15	198 $\frac{1}{2}$	73
21	Zául . . .	—	—	199 $\frac{1}{2}$	70
22	Laebiláchita . . .	Canopus	54 13 0	199 $\frac{1}{2}$	87 } Must be farther S.; apparently some error.
23	Arrát . . .	—	120 40 30		
24	Ditto . . .	Sirius	126 20 0	199 $\frac{1}{2}$	80
25	Ditto . . .	—	121 21 0		
26	Démbecha . . .	—	122 58 15	199 $\frac{1}{2}$	80
31	Ditto . . .	—	123 34 15		
Feb. 3	Ditto . . .	—	124 40 30	199 $\frac{1}{2}$	79
8	Ditto . . .	—	127 3 30		
Mar. 15	Rája . . .	Sirius	124 57 0	199 $\frac{1}{2}$	74
26	Wála (near source of R. Abai) . . .	Antares	104 1 30	196 $\frac{1}{2}$	74 See Dec 23rd and 24th, 1842.
Apr. 26	Kányarna . . .	(lo. li.	106 13 30	197 $\frac{1}{2}$	74
29	Zánami . . .	Dubhe	75 33 30		
30	Ditto . . .	Jupiter	116 3 0	198 $\frac{1}{2}$	60
May 2	Ditto . . .	(lo. li.	113 40 15		
5	Ditto . . .	Dubhe	75 33 0	198 $\frac{1}{2}$	60
8	Ditto . . .	Jupiter	116 3 45		
14	Ditto . . .	Dubhe	75 35 0	198 $\frac{1}{2}$	60
16	Yéddá . . .	Jupiter	116 34 45		
21	Ditto . . .	Jupiter	116 23 0	207 $\frac{1}{2}$	87 15 feet above the stream.
27	R. Abai (Málka Fárt) . . .	(up. li.	129 41 0		
30	Ditto . . .	Jupiter	116 48 30	198 $\frac{1}{2}$	60
25	Amwáta . . .	Jupiter	116 0 15		
26	Ditto . . .	Jupiter	115 57 45	198 $\frac{1}{2}$	60
27	Yálesh . . .	Jupiter	115 57 45		
June 19	Ditto . . .	(lo. li.	113 27 30	198 $\frac{1}{2}$	60
	Gimán . . .	(lo. li.	115 14 45		

Date.	Place of Observation.	Meridian Altitude.	Water Barred.	External Temp.	Remarks.
1843.					
June 25	River Abai (near Melka Kaku)	—	2002	84	*
26	Kineti (village)	—	1992	81	
Sept. 27	Tibela	Jupiter 110 30 15	1982	81	See Nov. 24, 1842.
28	Dima	Jupiter 113 30 15			
29	Dima	Jupiter 113 02 45			
27	Dima	Jupiter 113 25 0			
28	Dima	Jupiter 113 24 30			
29	Dima	Jupiter 113 27 15	1962	27	
30	Dima	Jupiter 113 28 0			
Oct. 1	R. Kadi (ford)	☉ 133 50 45			
22	Martina Miltan	☉ 131 49 45	1962	27	
23	Dima	☉ 131 4 45			
Nov. 1	Dima	☉ 128 22 15			
2	Knapilla	—	1972	27	
3	Mara	☉ 124 24 15	1971	50	See Feb. 24, 1843.
4	R. Abai (bank)	—	1942	27	12 feet above the stream.
5	Mr. Gindin (station)	—	1912	26	
10	Baqet	☉ 124 31 45	—	—	Doubtful: the latter seems preferable.
11	Dima	☉ 124 17 30			
12	R. Beshet (ford)	☉ 123 11 15			
13	Vauah	☉ 123 9 0	—	—	See Sept. 17th to 20th, 1842.
Dec. 10	Elchana	☉ 119 35 45	—	—	See Nov. 28, 1841.
12	Martina	☉ 111 17 45	—	—	
20	Gedara	☉ 116 40 0	—	—	Doubtful.
22	R. Kadi (source)	☉ 120 47 0	—	—	See Mar. 26, 1843.
23	Dima (source of mountain)	☉ 119 44 15	—	—	
27	Wider	☉ 117 22 45	—	—	
28	Wimadi	☉ 119 17 30	—	—	
1843.					
Jan. 9	Tawa-Gara	☉ 111 36 45	—	—	
10	Newa-Gablatan	☉ 113 36 30	—	—	Gishinkita Church distant 2 miles N. 20° E.
Feb. 25	Mina	☉ 126 9 45	—	—	See Nov. 4, 1842.
26	Dima	☉ 124 50 0	—	—	
27	Dima	☉ 124 30 45	—	—	
28	Dima	☉ 127 9 45	—	—	
Mar. 1	Dima	☉ 141 50 0	—	—	
2	Dima	☉ 144 25 30	—	—	
3	Dima	☉ 143 19 0	—	—	
4	Melcham Martan	Mercur 120 29 0	—	—	
15	Dima	Mercur 122 29 15	—	—	
16	Elawati	Mercur 122 44 0	—	—	
17	Dima	Mercur 122 45 15	—	—	
20	Kiladga	Mercur 122 20 30	—	—	

All the observations of meridian altitude were made with an artificial horizon. The data is always that of the astronomical day. The index error was $- 7' 10''$ throughout; and it is to be observed, that the index error in the observations in vol. vii. p. 181, should be $-$, instead of $+$, as there stated. The observations of the sun there as here recorded are all of the lower limb of that luminary. The barometrical, for determining heights by boiling water (by Newman), was marked 29.625 height of barometer.

II.—REGISTER OF THE WEATHER IN SHOA AND GOJAM, 1841-42.

Register of the Weather at Ankober, in April, 1841.

THERMOMETER.						Remarks.
Date.	Numer.	F & W.	About Midnight.		F & W.	
			Time.	Range.		
1	—	60°	12½	55°	52°	The astronomical day is used.
2	60°	61	11	56	53	Wind N.E.
3	63	61	13	56	54	
4	65	60	12½	55	53	6½ h., rain till midnight; overcast next morning.
5	64	61	11½	57	53	11 h., rain.
6	63	59	—	—	53	
7	65	60	13½	56	54	
8	64	59	13½	54	52	3 h., rain till near 4 h.; then overcast, with distant thunder all the afternoon; 6½ h., rain again, and very thick all night.
9	66	61	11	57	53	6½ h., shower; overcast all night.
10	—	61	10½	58	53	3 h., shower; night thick, with distant lightning.
11	65	62	14	55	54	1 h., shower; 13 h., heavy rain.
12	67	61	11	58	54	
13	68	61	11	59	53	
14	68	Thermometer or broken.				6 h., heavy rain all night.
15	—	—	—	—	—	
16	—	—	—	—	—	4½ h., heavy rain, with thunder, till 8 h.
17	—	—	—	—	—	6 h., very heavy rain, with thunder, till 15 h.
18	—	—	—	—	—	
19	—	—	—	—	—	During night, heavy rain and thunder.
20	—	—	—	—	—	None till 1 h., shower.
21	—	—	—	—	—	
22	—	—	—	—	—	None, shower.
23	—	—	—	—	—	1½ h., shower; evening, two slight shocks of earthquake, and again one next morning; during night, heavy rain.
24	—	—	—	—	—	Night, very heavy rain; morning, very thick; and 20 h., rain.
25	—	—	—	—	—	
26	—	—	—	—	—	Left Ankober for Golem.
27	—	—	—	—	—	
28	—	—	—	—	—	Occasional rain till about the end of the month.
29	—	—	—	—	—	
30	—	—	—	—	—	

1841.

May.

Ankober.—Wind N.E., and blowing very strong and cold. Rain ceased till the 26th, when a storm blew up every evening.

1842.

May.

Golem.—Fair till the 12th, on which day and the 13th it rained at night; no likewise in the evening of the 16th and 22th. From the 28th, till the end of the month, heavy storm in the evening, with thunder and lightning.

1841.

JUNE.

Rain till the 5th; then ceased, and fine weather till the 11th, on which day, at 5 P.M., a heavy hailstorm, which made the ground quite white. On the 12th and 13th, heavy rain during night, and then again fine weather till the 25th, when, at 1 P.M., it began to rain. After that date it rained every night, and often during the day, the rainy season having regularly set in.

JULY.

Rains continued.

AUGUST.

Rains continued.

SEPTEMBER.

1st, rain suddenly ceased, and fine weather till the evening of the 3rd, when it began again, and continued till the 11th, when it finally ceased, with the exception of a slight shower on the 16th, and a heavier one on the 19th. Very fine weather afterwards, with strong cold wind from E., till the end of the month.

OCTOBER.

2nd, heavy rain during the night. Fine weather during the remainder of the month, with very cold wind blowing day and night from N.E. Quitted Shoa.

Angorcha.—30th and 31st, heavy rain, with thunder, in the evenings.

NOVEMBER.

Angorcha.—Heavy rain, with thunder, in the evening; afterward fine during journey westward into Gojam.

1842.

JUNE.

Rain more or less every day during the month, with the exception of the 5th, 14th, 19th, 23rd, and 29th. On the 4th it hailed, at Amwatta, so heavily, that the hail (I was told) remained on the ground for three days. On the 18th, in consequence of a violent storm during the night, the R. Abai suddenly rose three feet; but it fell again next day. The rains were much earlier this season than usual. Still they did not set it regularly till the 30th.

JULY.

Rains continued. On the feast of St. Abbo, in the month of Hámle (corresponding with the 11th of July of our Calendar), the Abai is considered to have risen so as to be no longer passable. After "Hámle Abbo," therefore, all communication between the opposite banks ceases.

AUGUST.

Rains continued.

SEPTEMBER.

Rains continued till the 16th, which day was remarkably fine. The barley harvest now began. Still, until the end of the month, it continued to rain every night, and sometimes even in the daytime.

OCTOBER.

Heavy rain continued every night (excepting the 4th) till the 7th, when, *for the first time*, none fell. The rains said to have continued longer this season than usual. Yet, notwithstanding this duration, the rivers had fallen considerably, and the Abai was already crossed by the Gallas, bringing cloths and cotton to Baso market. The rain kept falling every night during the month, and sometimes heavily, with the exception of the 9th, 14th to 16th, 20th, 26th to 28th, and 30th to 31st. On the 17th, hail.

NOVEMBER.

Rain on the 5th, 11th, 12th (heavy, with hail), 20th, 29th (heavy, with hail), and 30th. This continued bad weather much hurt the crops, and a famine was feared.

1841.

DECEMBER.

Gojam.—Fine.

1842.

DECEMBER.

The first three days still showery, when the rains appear to have ceased in Gojam; but in Damot they were said still to continue. Rain again on the 14th, 16th, 17th, 22nd, 23rd, 24th, 25th, and 27th; the last five days, heavy.

1842.

JANUARY.

Fine.

FEBRUARY.

Rain fell a few times, but very slightly.

1843.

JANUARY.

Fine.

FEBRUARY.

Slight rain on the 2nd, 3rd, 4th, 5th (violent storm), 6th, 19th, 21st, 22nd, 25th, and 26th.

MARCH.

During the month frequent and sometimes heavy rain.

MARCH.

Rain, slight on 4th, 5th, 6th, 13th (violent storm), 17th and 18th (storm), 25th, 26th, and 27th.

APRIL.

Heavy rain on 4th, 5th, 19th, 21st, and 22nd; remainder of month fine.

APRIL.

Rain on 3rd and 4th, and then from the 15th till the end of the month, with the exception of the 24th, 25th, and 28th.

III.—Caravan Routes through Abyssinia.

In vol. x. p. 580, is given an itinerary from Tajúrrah to Aussa by the way of Gágade and Lake Abhébbad, which was obtained by me at the former place, and transmitted from thence in December, 1840. The following note respecting Lake Abhébbad accompanied the itinerary, but was not published with it. "The length of the lake is 1 day's journey on foot: it contains seven small islands. Between it and the river Hawash is a high mountain called Dámma 'Ali." To this is to be added that the river falls into the lake to the southward of this mountain, as shown in a sketch made for me by a native of Tajúrrah, a copy of which was transmitted with the itinerary. The following particulars of routes, &c. have since been collected:—

1. Route from Tajúrrah to Aussa by the way of Raháita.

Tajúrrah (native name Tagúrri)

Ele'énta

Haigúnnub

Kárbata

Argíta

Kúnni

Raháita

Gá'ala

Kabálle

Holbaáta

Travelling rather quickly: with female slaves it takes 8 days.

Travelling rather slowly with female slaves.

Dugúgura	}	Travelling rather slowly with female slaves.
Háro		
Chóbi		
Kárkura		
Gándadényu		
Háluko		
Bila		
Cross R. Hawash		
Aussa		

2. Route from Aussa to Dówe.

Aussa	}	Gentle travelling with female slaves. The road after crossing the Hawash, on quitting Aussa, keeps the river all the way on the left hand.
Cross R. Hawash		
Chéffi		
Arabatésa		
Cross R. Milli		
Agámíti		
Bakársa		
Tá'a		
Ká'ab		
Ilála		
Léid (mountain)		
Jeld		
Sid		
Dówe (market)		

3. Route from Dówe towards Aussa and Tajúrrah.

Dówe	Dówe
Háro	Háro
Anka'éla	Inka'éla
Remi	Reim. Near this station is a large lake.
R. Hawash	R. Hawás
Galáito	Galáito
Taréira	Sheka'éla
	Inkeúnda
	Aussa

This informant knew the road to Aussa no farther. He said that he would another day continue it as far as Tajúrrah without passing through Aussa; but I saw him no more. He said that from Dówe to Aussa is 15 days by caravan, or 8 days quick travelling, and that from Aussa to Tajúrrah is the same; the two distances being about equal.

The lake here mentioned is apparently Lake Ardibbo, near Géra, alluded to by the Rev. Mr. Krapf in p. 400 of his 'Journals.'

In the latter part of this route several stations are evidently omitted.

In the centre of the country of the Adál is a high mountain called in Abyssinia Guráli, which is visible from a great distance all round. In the old Portuguese maps the word *Gurele* is attached to the name Auça (Aussa), which is not improbably caused by the mountain being in the

neighbourhood of that place, whence the two names got confounded together. I apprehend that the real name must be Gur (or Gura) 'A'li, the latter word signifying *mountain* in the Dankali language.

* 4. *Route from Dówe to Ain Amba and A'das.*

Dówe (market)	}	Warrakállu.
Kállu		
Riéki (Miéta close by it)		
Ain Amba (capital)		
Derekwéra	}	Warrahémano.
R. Legaláfto		
A'das (market)		

Ancháro, the principal market of Warrakállu, lies close to Ain Amba, at the foot of the hill on which that town is situate.

Dówe lies eastward of Ain Amba, being below it, on the edge of the high land, which there falls rapidly towards the country of the Adál or Danákil, in the same way as it does from Ifat.

5. *Route from Ancháro (Ain Amba) to the Markets of Yéjju.*

Ancháro	}	Warrakállu.
Aturi (market)		
R. Milli		
R. Bechachéfi	}	Yéjju.
Woldéa (market)		
Adami (market)		
Cross R. A'la.		
Gúrra (market)		

The market of Gúrra is frequented by the Danákil, but it is the women alone who bring their loaded camels, and buy and sell in the place of the men, who keep away altogether in order to avoid bloodshed, this country being the scene of constant feuds among the different tribes. I could not learn that Gúrra has any connexion with Gura 'A'li.

6. *Route from Ancháro to Sókota.*

Ancháro	}	Warrakállu.
Gádera		
R. A'djawaha		
Mérsa	}	Yéjju.
R. Cherawaha		
Adami		
Woldáia		
Sánka		

Thence 3 days to
Sókota.

A'djawaha is the frontier between three states, viz. Teholadérri, Yéjju, and Ambásel, belonging to Warrakállu.

From Mérsa to Woldáia, *by the upper road*, is only 1 long day: the road here given goes round eastward by the market of Adami.

7. Route from Adami to the Country of the Adál (Táltal).

Adami	}	A long day's journey.
Gúrra		
Ráia	}	These are not days' journey, but only the countries passed through.
Zóbul		
Adál		

The Ráia Gallas are the A'zabo (Assubo) Gallas of the maps. The country of Zóbul is between the Ráia Gallas and the Táltal (Danákil), the inhabitants of the salt plain (Hárho), from whence Abyssinia is supplied with rock-salt. Zóbul is a very fine country, well wooded, and producing grapes, olives, limes, cedars, &c.; but in consequence of long devastating wars, it is now entirely uninhabited and waste. The people of Lasta say that it has remained so since the time of Ahmed Grañ (Mohammed Gragne). When Ras Ali (*tálak*, i. e. the elder), the son of Gwángwul, the chief of the Yéjju Gallas of Angot, mentioned by Bruce, marched through Zóbul against the Adál, his army spilled a quantity of *dhúrrah*, which has since continued to grow there from year to year without cultivation. There are said to be many ruins of the former kings there. The river Gólina runs through Zóbul, having its course southward, and uniting first with the A'la and then with the Milli, before reaching the Hawash, with which river they unite. By the Gallas the Gólina is called Gólina, and the A'la is called A'ura: the Milli retains its name throughout.

The following is an extract of a letter, dated Yáush, August 13th, 1842, and addressed to the Rev. J. M. Trew:—"There is one point on which I may fairly take a little credit to myself; it is with respect to the identity of the river Anázo of the maps with the Hawash. In July, 1840, before leaving England, I asserted this identity, and placed in the hands of Capt. Washington, then Secretary to the Royal Geographical Society, a sketch showing the course of the Hawash in accordance with my views, which I have since found to be substantially correct, for the R. Milli (Melee), forming the boundary between the Teholadérri and Yéjju Gallas—which in the maps is made a tributary of the Anázo—actually runs to the Hawash."

I was at the same time inclined to the opinion that the Anazo, or Hanazo, has no separate existence, but has got inserted in the maps in consequence of a misspelling of the Portuguese name of the Hawash—*Anaxo* for *Avaxo*. The following extract from Ludolf's *Historia Æthiopica*, is, however, against such an opinion:—"Omnia flumina magna et fluentia parva intrant in Nilum, et non remanent nisi duo fluvii; unus vocatur Hanazo [Ἀῤῥῖ] qui reperitur in Hangota: et alter vocatur Hawash [Ἀῤῥῖ], qui fluit propè Dawarem et Fatagaram."—*Lib. 1, c. 8, s. 48*.

In our present imperfect knowledge of the eastern portion of Abyssinia, it is impossible to say that such a river may not exist. All that can be safely done is to assert the identity of the Anazo of the maps (the recipient of the Milli, Ala, &c.) with the Hawash.

Beyond Zóbul are the tribes of the Harsimáli, Ashénto, and Modáitu Danákil.

8. Routes from Warrakállu and Warrahémano westward to Gójam.

The merchants of Warrakállu and Warrahémano go to Báso to purchase slaves, ivory, coffee, &c., which they dispose of in part to the Yéjju Gallas and the merchants from Tigre, and in part sell at Dówe to the people of Tajúrrah. The rock-salt from Tigre reaches Gójam partly by this road, and partly by that of Sókota and E'benat. To Shoa it is taken from Warrakállu by the way of Mariámmi.

(1.) Ain Amba		R. Shótelmat	
Tótola	} Warrakállu.	Déreba	} Legagóra.
Mótie		R. Machélla	
Chérecha	} Wollo Gallas, Legámbo.	Derekúmba	} Legámbo.
Mósabiet		Gol (an Amba)	
Gánnatie		R. Káchilit	
Báso	} Bórana.	Lugwáma	} Bórana.
Bórana		Tirtira	
Chákata		Kalála	
Zóbunwaha		Damásiko	
Gorenj	} Gójam.	Wogiddi	} Gójam.
R. Abai		Chákata, &c.	
Bárenta			
(2.) Ain Amba		(5.) Ancháro	
Tótola	} Warrakállu.	Yegóf	} Warrakállu.
R. Kállina		Kóri	
Chérecha	} Legámbo.	Shótelmat	} Legagóra.
Aizaga		Dissim	
Mósabit		Gátira	} Legahída.
Legámbo	} Bórana.	Derekwáha	
Báso		Abállo	} Bórana.
Damásiko	} Gójam.	Gafársa	
Wogiddi		Wálaka	} Gójam.
Chákata	} Gójam.	Chákata	
Góba		Zohunwáha	} Gójam.
Erribibbi	} Gójam.	R. Abai	
R. Abai		Cheríya	} Gójam.
Gibbi A'mba	} Gójam.	Bárenta	
Bárenta			
(3.) Ancháro (Ain Amba)		(6.) Ain Amba	
Fállana	} Warrakállu.	R. Borkénna	} Warrakállu.
Albúko		Yegóf	
Shótelmat	} Legagóra.	Gósi	} Legagóra.
Enlédi		Karamára	
Kalála	} Bórana.	Shótelmat	} Legahída.
R. Wálaka		Tállo	
Chákata	} Gójam.	Kulémbi	} Legagóra.
Bonáiyu		R. Sélgi	
R. Abai	} Gójam.	Legagóra	} Legahída.
Kushashilla		R. Machélla	
(Barenta)		Gol	} Bórana.
(4.) Ancháro		Abállo	
R. Borkénna	} Warrakállu.	Kalála	} Bórana.
Yegóf (an Amba)		Wálaka	
Gósi	} Gójam.	Chákata	} Gójam.
Albúko		Cheríya	
		R. Abai	} Gójam.
		Shambúko	
		Bárenta	

(7.)	Ain Amba	}	Warrakállu.	Andéssel	}	Amhara
	Tótola					Fitwaha	(chief Dáud Berílle).
	Bárara	}	Warra- hémáno.	Kólló	}	
	Kosibba					Gáddagad
	Singola	}		Wáro	}	Amhara
	Móakat					Tádbaba Mariam	(chief Berílle Yeliémtó).
	Gáddagad	}		Gádwaha	}	
	Wáro (market)					Kuhlmiéda
	Melaksínka	}	Wollo Gallas, Ambára.	Jirafgótet	}	
	Saint (Dansa market)					A'hiyu
	A'hiyu	}		R. Abai	}	Gójam.
						Warrabénnya
				Mártola Máriam		
	R. Abai	}		(9.) A'das	}	Warrakállu.
	Warrabénnya					Kosibba
	Katkáttá	}	Gójam.	Móakat	}	
	Mártola Má- riam					Jakéssó
				Gulimti	}	Wollo Gallas.
				Wáro		
				Farnsbahr	}	
				Dánsa (Saint)		
				A'hiyu	}	
				R. Abai		
				Warrabénnya	}	Gójam.
				Katkáttá		
				Mártola Máriam		
(8.)	Ain Amba	}	Warrakállu.		}	
	R. Berkénna					
	Derekwéra	}			}	
	R. Kalina					
	Kimir dingiai	}	Wollo.		}	
	R. Laggalásto					
	Barára					

9. Route from Gójam to Ifut (Shoa) by the way of Warrakállu.

My servant Wálda Georgis, on his second journey to Shoa (in Dec. 1842), accompanied a party of salt-merchants from Barénta to Tótola, from whence he went on alone to Shoa. He informed me that after leaving Tótola he passed through an extensive country known by the general name of Jámma, the first part of which belonged to the Galla chief A'dara Bihle, and the latter part to the chief Hassan Dullo. On the seventh day from Tótola he crossed the river Jámma, and arrived at Jiru, from whence another day brought him to Angolállá. His return journey he gave me as follows:—

Ankóber	}	Within the territories of the King of Shoa. The days' journeys in Shoa were very short; but afterwards they became long.
Aliuámbe		
Chánno	}	Mariámmi is the market of Assélleli; Antziókia is close to Assélleli, on a mountain to the W. of it.
Arámbe		
R. Gashabakíndi (valley)	}	
Ya-usba-ters		
Debra Selássie	}	
Majétti		
— station	}	
Mariámmi		
— a long day and cross R. Berkónna.		
Ancháro	}	1 short day's journey.
Tótola		
Chéreacha.		
Mósabiet.		
— station.		

Mósabiet station	}	Bórana,	There is a large river between Chákata and Mt. Gafársa.
— station		or	
Chákata		Gafársa.	
Zohunwaha (valley)	}	Gójam.	
R. Abai			
Barenta (valley)			
Kuchichilla			
Enaónta			
Yáush			

10. Route from Mota to Lalibala.

Móta	}	Gójam.	Zebti Mieda	}	Lasta.
Gerarwaba			Shedobo		
Cross R. Abai			Lalibala		
Shimie					
Estie	}	Biégemider.			
Guna					
A'brajit					

11. Routes from Ancháro to Gondar.

(1.) Ancháro	}	Warrakállu.	Zoramba	}	Biégemider.
Derekwera			Terienibélla		
Totola			Zank (Sinko?)		
Háata *	}	Warrabémano.	Báta, &c.,	}	as in 1st route.
Sángola					
Tánta	}	Ambára.	(3.) Ancháro	}	Warrabémano.
Dissim			Atúri		
Kórieb			Warkária		
R. Bashilo	}	Biégemider.	Kaskas	}	Biégemider.
Ardwaba			R. Bashilo		
Móga			Wádela		
Aráta	}	Biégemider.	Zébit	}	Biégemider.
Míkiri			Chéchebo		
Máhdara Ma- riam			Zoramba, &c.,		
Ambo	}	Warrakállu.	as in 2nd route.	}	Warrakállu.
Yefag (Báta)			(4.) Ain Amba		
Harno			Kombélcha		
Mágach	}	Warrakállu.	R. Barkónna	}	Teboladérri.
Gondar			Títa		
			Káskas †		
(2.) Ancháro	}	Warrakállu.	R. Bashilo	}	Long day.
Derekwera			Dalánta		
Totola			Wádela		
R. Legalafto	}	Warrabémano.	Talak Zébit	}	Biégemider.
Fáta			Tanash Zébit		
Jíffa			Nefas Máwacha		
Tánta	}	Warrabémano.	Zor Amba	}	Biégemider.
R. Bashilo			Kulwalbúko		
Dalánta			Réb		
Dáunt	}		Ifag, &c.	}	
R. Jíta					

* Háata is on the frontier of three States, Wollo, Warrabémano, and Warrakállu.

† Mount Ambásel is above Kaskas towards the right.

11. *Route from Abállo to Adowa.*

Abállo. See 8 (6) Legabida.		Ifag
Ambacho-ber	} Legámbo.	Ebenat
Búso (market)		A'disha
Farasbahr	} Ambára (chief Daud Berille).	Abbáchóngwar
Melaksánka		Lasta desert
Waha miéda		Abbahoíba
R. Báshilo		R. Takkazie
Wanaággi	} Biégemider.	(Crossed 15 times in 1 day)
Yekwáa		R. Chirech
Gallagódana		R. Shotelmátabia
Misirkítta		R. Takurwaha
Jati		Shóla
Mahdera Ma- riam		Tembien
Sinko		Takirákira
Reb		R. Kuhlwaha
		R. Maibahr
		Adowa

12. *Route from A'das to Débra Tábor.*

A'das	} Warrahémáno.	A'awol	} Daunt.
Cherecha		Dáunt	
Jiffa		Sántalwaha	
Gomláait		Jitta	
Débbek		Nege	} Biégemider.
Yewóat		Zorámha	
Siéda		Debra Tábor	
Kóreb			
R. Bashilo			

The foregoing routes were furnished me at various times by different native merchants; and although they occasionally exhibit slight discrepancies in the details, in their main features they are quite consistent and confirmatory of one another. They are given for the purpose of filling up the *central* portion of Abyssinia, of which the existing maps still give but an imperfect representation.

11.—*Extract from a Journal by Lieut. W. CHRISTOPHER, Commanding the H.C. Brig of War 'Tigris,' on the E. Coast of Africa. Dated 8th May, 1843.*

SHOULD any attempt be made to penetrate Africa from the eastern coast, I would strongly recommend the neighbourhood of Kílwah to be avoided; its climate is most deadly to Europeans; while, on the other hand, the natives repute the climate of Mombas, and northward, exceedingly healthy and recruiting in its effects.

I called on the Sultan of Kílwah and gave him assurances of good will and amity; he presented me with a trifling gift of sheep, and received an equivalent return. The people of Kílwah are well disposed to the English; the forts, which were once formidable, are now complete ruins. On leaving Zanzibár there

was every expectation of meeting a slaver of twenty-two guns; the crew were all in health, and our hopes were high of earning distinction and meriting applause. A few days after quitting Kilwah a most virulent fever broke out: in three days young men and old were brought to the grave; and I had the melancholy duty of burying three Europeans from our small number in one day. I could not avoid the reflection that the amount of suffering would have probably been less in an action with the slaver, and the loss of life perhaps not greater. Returning to Zanzibár on the 28th of February, I experienced the kind and valuable aid of the British and American Consuls, who, from their local experience, were well able to give advice. After remaining at Zanzibár till the 4th of March, I hastened to procure better water at Mombas, where I anchored on the following day.

The fort of Mombas is the best on the coast, and has a garrison of Belúchis, twenty in number; they are regularly paid 2 or 3 dollars a month, and provide their own arms, matchlocks, and swords; the Jemedar, or Kilahdar, is also a Belúchi. The trade from Mombas is trifling; there is no fresh water in the neighbourhood excepting from wells. The town of Uzi, about 20 miles to the S. of Laméi, appears to be the mart for the commerce of this neighbourhood; there the Gallas and tribes from the interior meet the Arab merchants. The Wánika tribe are situated 2 days' journey from Mombas, in the interior. As a specimen of native names I record the following designations of tribes of the interior to which the slaves brought to the coast usually belong: Mihani, Mingindo, Mumwera, Makiwa, Makondi, Michinga, Matumbi, Manyassa, Mubisá, Monumizi. These people buy and sell each other, being all slaves and slave-dealers by turns, and the residents on the coast cannot tell which is the most powerful or influential; people of each tribe come down as slaves and as merchants, sometimes, however, fighting just before reaching the slave-markets. Frequently the natives of the interior come over to Zanzibár; and intelligent European residents say, there would be little danger of treachery in accompanying them back to their country. As they do not know the use of money, they are dealt with by barter, very much to the advantage of our Indian subjects: there are said to be from forty to sixty Banians constantly resident at Chebinga, a slave-mart near Kilwah.

I filled water quickly, the authorities assisting me, in consequence of the Imám's orders, free of charge; I nevertheless deemed it expedient to remunerate them for their labour. Having some days previously vacated the poop-cabin for the sick, in order to separate them from the rest of the crew, I found so great an improvement in their state in a few days, as

well as in the general spirit and alacrity of the men in their usual duties, that I felt justified in giving up my previous intention of visiting the Seychelles to recruit, and, with renewed pleasure, had the prospect before me of fully accomplishing the wishes of the political functionaries.

Leaving Mombas on the 9th of March, I reached Bravah in 9 days, having to surmount a current which has retarded the vessel to the amount of 365 miles in the latter 7 days.

My inquiries at Zanzibár had quieted my apprehensions considerably, but I naturally felt anxious, as the letters from the Imám to places northward of Mombas merely contained friendly advice, and were not imperative.

March 18th, Bravah.—Arrived here at sunset; anchored about half a mile southward of a landmark or watch-tower, said to have been built by the Portuguese, on a rocky islet 200 yards from the shore: bearings at anchor, landmark and Bravah Town in one N.E. $\frac{3}{4}$ N., southern extreme of land S.W. $\frac{3}{4}$ W.; 9 fathoms sand 1300 yards from the nearest shore.

19th.—Landed for chronometric observation, which gave the Minaret, or landmark, in $1^{\circ} 5' 17''$ N. latitude, and $4^{\circ} 19' 51''$ E. of Mombas fort. The latitude was ascertained by thirteen separate observations of stars N. and S. of the meridian. In the evening landed at the town in an armed boat to call on the chief and deliver the letter of Imám Seïd Seïd of Zanzibár, together with the letters relative to the wreck of a bugaló having British property on board, which was very urgently wanted at Zanzibár. I was received in a warm friendly manner, to my surprise, and conducted to the best-looking house in the place by a Sómálí chief, named Hadjí Awisa, who carried in his hand a highly ornamented sword, which I was afterwards informed was sent to him by Seïd Seïd. I had not been seated many minutes before a man of very unpromising appearance, with large features, and a dead yellow eye, his unusual height somewhat lessened by an ugly stoop, came towards me, holding some papers in his hand, which, after the usual compliments and inquiries, and seating himself, he unceremoniously presented for perusal. These papers were very important documents for a stranger intent on examining the country in the neighbourhood and gaining information; the first was giving the bearer a high character for honesty and fair dealing as a broker or agent for purchasing cargoes, hides (principally), and ivory; the next was a statement written by the harpooner of an English whale-boat, acknowledging the great kindness and attention shown him by the bearer, "Dera," he (the harpooner) having, with five others, when chasing a whale, unfortunately lost his ship, and making for the nearest land reached it, about 60 miles N. of Magadishú, in 9 days. Two of his companions had

died from exhaustion, and the officers expiring shortly after reaching the shore, he and the survivors were brought down to "Makutshú" by the natives, and, I fancy, sold as slaves unknown to themselves. "Dera" said he rescued them from the people of Makutshú for 30 German crowns; which is probably true, as the statement says they were badly off until they arrived at "Bravah."

I made arrangements at once to visit the river in the neighbourhood, said to be 2 hours off, at the back of the line of sand-hills, of 150 to 250 feet elevation, which abut on the sea-shore hereabouts, and form a continuous line nearly parallel with the beach, at about 2 miles distance. Having satisfied myself that the people were well-disposed, I returned on board, taking with me the man who engaged to be my guide for the morrow.

20th.—We started before daylight from the vessel, passed the town, which is a mile from the landmark, before sunrise, being joined by Sheikh Awisa (before mentioned), who declared his determination to accompany me. I found him a very amusing but vainglorious companion; he had the fine cast of features of the Sómális, though very dark in colour, and hair somewhat crisped. We saw two kinds of antelope, the one of a spotted fawn-colour, with spiral annulated horns, standing somewhat higher than the largest sized goat; the other, "Salt's" antelope, very numerous. Of birds, there were a large brown hawk, the bare-necked vulture, the gigantic crane, another species, usually called the "common stork," having a red bill, and black about the covert feathers of the wings, besides honey (humming?) birds of every hue, the green and gold flashing in the sun as they flitted past. Proceeding direct to the cultivated ground in the neighbourhood of the river, we found the country was artificially irrigated for 2 miles from its banks, and Indian corn and juwari in a very flourishing state. The stream being still distant, we retired under the grateful shade of a large acacia, which at this season was in full flower. Skins being spread on the ground, all were soon seated, and the hospitality of our host produced excellent mutton boiled with rice; the only peculiarity being that the slaves, seated at some distance, were eager to receive the bones picked by their masters, which underwent a second, third, and fourth gnawing from successive hungry mouths before they were finally scattered as useless. All these people eat fat in large solid quantities. The first course, as arranged by the sheikh's kind offices, was a large bowl of rice, on which ghi (liquid butter) was poured, and then boiled meat piled up—the latter soon disappeared; next came a small proportion of the rice with neat lumps of fat piled upon it, in a similar way to the meat, and they vanished as quickly; the remainder of the rice was then deluged with milk, and the bowl emptied: the whole occupying about five minutes. (I beg to say I was merely

a spectator.) The meat, after Abyssinian fashion, was crammed into the mouth, and then a knife passed through it close to the nose and lips, no man taking time to consider how much his mouth would hold, but incessantly putting it to the proof: a sheep disappeared between seven of them; for we had two strangers, old Sómálís, persons of respectable appearance, who, after partaking of coffee, pronounced a sort of benediction on the provider of the feast, wishing him every blessing of heaven and earth, rain, fruitful seasons, and to his children's children honour among men. The Sómálís here eat coffee stewed in ghi, the bean slightly bruised only, with the husk. The docility of the slaves is remarkable; their greediness in receiving the bones of their master's leaving has been already noticed: they are the only herdsmen and shepherds; the sheep are the black-headed variety. All went to sleep about 11 A.M., and rested till 3, when we had settled to start for the river. I found the whole of the people very communicative, but very ignorant even of their own neighbourhood, and continually making contrary statements as to distances, numbers, and qualities; what information I gained, and could depend on, has been embodied in the rough sketches and notices of this neighbourhood.

It was a very fatiguing trip from the tree to the river; we were full 3 hours going and returning, but the muddiness of the ground was the cause, not the actual distance. A common short hoe was the only implement of husbandry in use; the slaves and their wives being the labourers, housed miserably in small half-roofed huts, their usual food parched Indian corn and fish from the river. Of the latter I purchased a large kind of cat-fish, weighing two or three pounds, and a snapper, of a pound and a half, for a trifle. As we passed on, sometimes wading up to the middle in water, and always trudging over soft mud, with tufts of grass here and there to relieve the foot, we started numerous birds from their perches; the white Egyptian ibis, rising in pairs, was conspicuous, with its powerful black beak and neck bare of feathers, the kullum also, and two species of divers, besides every variety of crane, black, white, and slate-colour. On approaching the edge of the river we found it somewhat sunken in its bed, the streamlets of the swampy ground over which we had passed running into it. Numerous alligators frequent the stream; which, I was told, is now at its lowest, the periodical rains being daily expected: we found it from 70 to 150 feet broad, and 10 and 15 feet deep, with a current, by estimate, of $1\frac{1}{2}$ mile an hour, taking a turn W. by S. at the point where I was standing, having come from a direction due N. (true). This elbow in the stream, by prismatic compass and estimated distance, is due N. of the town of Bravah 7 to 8 miles. The country all round is spotted

with trees, and appears level, as far as the eye can reach, in the interior. In returning, we succeeded in shooting an ibis, apparently a young bird, the neck having a little remains of down and feathers on it, not so thoroughly leather-necked as the older birds become. Having passed the night in the open air, sheltered somewhat by a hedge on the windward side, under which, by my guide's forethought, the hides had been spread, I returned to the ship in the morning, after partaking of a breakfast of fowl, tea, and milk, obligingly provided by Dera. I asked him again to let me see his papers, as I had imperfectly perused them by my lamp-light: they prove that Bravah, for fourteen years, has been a welcome port to European and American traders, several of whom have resided on shore for days at a time. The chiefs, seven in number, say that Captain Owen's visit reconciled them to European intercourse. The river Jubba, or Gavind, is under the authority of the sheikhs of Bravah, who, on being closely questioned by me, mentioned every particular of the murder of the men belonging to the frigates *Leopard* and *Dædalus*, that sent their boats for water during the expedition to the Red Sea. Their statement perfectly agreed with an account I had obtained from an old fisherman two days previously.

As the principal men were present, besides a changing assembly of about thirty others, I determined, on the spur of the moment, influenced by the candour of the people, to offer repayment to Dera of the thirty German crowns which he had remitted to Makutshû to rescue from slavery those of the crew of the English whale-boat who had escaped being killed. The offer was accepted in silence, and, I trust, it will leave a very beneficial effect. I, at the same time, gave a written document, stating the reasons why I had given the money, and I reminded the chiefs that any expense sustained for a similar purpose would meet a return, but that it would be better to procure, in any similar case, a writing under the hand of the sufferers, mentioning the amount that had been paid on their account. I had asked why they did not procure a writing in the present instance; their reply to me was nobly thrilling: "They were strangers and naked; could we ask them for anything?"

Having taken in three or four tons of water on a difficult beach (rocky and surf), and performed the object of my visit in ascertaining that such part of the cargo of the wrecked bugaló as had reached Bravah had been sent on to Zanzibár; and the portion of the crew which had suffered from the endemical fever of Zanzibár being in a fair way of recovery, I deemed it my duty to keep the coast from this port upwards.

I therefore weighed, and found the currents still very strong,

setting 35 to 45 miles a-day to the S.W. The wind hanging to N.E., it was eight days before we reached Moonguiá. The only village noted on Owen's chart between Bravah and this anchorage is Torre: it is walled, and situated on an elevated peninsula overlooking the sea: it contains about 300 inhabitants, herdsmen and growers of cotton; they are under the influence and protection of the Bravah Sómáli chiefs. Hearing that the river approached the sea nearest to a place called Galwen, represented as 4 miles only from the beach at Moonguiá, I purposed anchoring in order to endeavour to examine the neighbourhood, having before sent on a Bravah guide in the launch with an officer to examine the anchorage; but finding the soundings extend only a small half-mile from the beach, I did not at this season deem it prudent to anchor, the weather being squally and unsettled. The anchoring-ground is good, being soft sand and clay, at a depth of 8 and 9 fathoms; but it deepens suddenly to no ground at 30 fathoms. In the north-easterly monsoon, I apprehend, there would be no danger for a vessel anchoring abreast of the weather-reef, under the protection of which a boat can nearly always land in calm water; the anchorage is a good one for country craft, there being a break in the reef which runs parallel to the shore for about 200 yards' distance, having 1 to 3 fathoms inside of it. The day subsequent to the landing of the Bravah guide, I went on shore early in the morning, and to my annoyance learnt that the people of Galwen had threatened the guides with instant death, if they brought a Feringí to their town. Foiled in this attempt, I remained about an hour on shore conversing with people who had come from the town, and visited the ruins of an Arab settlement which was once of considerable extent, but, as I was informed, suffered so much from petty wars of rival Sómáli chiefs, that its inhabitants returned to Bravah. The country here is spoken of in raptures by the people; they compare it to Basrah and the banks of the Euphrates. The sugar-cane and all Indian productions grow here luxuriantly; among others, a delicious wild-fig is abundant; the plantain, pomegranate, coconut, melon, tamarind, almond, Indian corn, and millet are abundant and cheap. Eight Bengal rice-bags, weighing 1280 lbs., are sold for one dollar. Having explained to twenty or thirty men belonging to Galwen, who were friendly in their manner (though a few showed much astonishment and fear, not having seen a white man before), that I came with peaceful intentions—for, though the boat's crew was armed, I could appeal to the vessel being two or three miles in the offing as a proof that I did not come for war—and made a small purchase of juári, I returned on board by 10 A.M., and anchored off the town of Merkah the same evening, losing one day in this abortive attempt.

April 1st.—Landed at Merkah for chronometric observations, and called on the chiefs, producing the Imám of Zanzibár's letter. Here I was received civilly by an Arab merchant of respectability, to whose house the heads of the Sómáli tribes of the neighbourhood came in the course of an hour or two. One chief was wanting: I heard he was the principal, but now bed-ridden from age, and I waited on him in the evening. This trivial circumstance had an excellent effect. I found the Sultan, as he is styled, of Merkah seated on bullocks' hides, in one of the round Sómáli huts, opposite to a little window. I say hides, as the only visible distinction between his circumstances and those of poorer men consisted in perhaps a dozen hides being placed on each other to form a bed, instead of a single one sufficing. He is blind with age. I told him I had heard he was unable to leave his house, so had come to him. He was profuse in his expressions of good will, and insisted on feeling my clothes, and keeping his hands on some part of my person while I remained. He had never seen, and, poor man, was never destined to see, an European. Telling him I had come in peace, and wanted a few supplies, and to go up and see the country, he said he could not answer me that the elders of his tribe would agree to this; that, please God, I should obtain all my wishes. The following day the chiefs presented the ship a bullock, for which they received a return in cloth. I then told my host, the Arab merchant, that I wanted to go to the river in-shore. He said it would be impossible to go without the Sómális' good will. I then begged him to call them all, and consult. They met, and agreed to guarantee my safety and provide a guard, which they stated would be absolutely necessary, but that I must make them a compensatory present, as no European had ever penetrated the country here. I consented to give them fifty dollars. The Imám of Zanzibár's letter had little effect. As the vessel was watering, and one day would suffice to go to and return from the river, I determined immediately to go, and alone, as, though I apprehended little or no risk, yet I conceived it better to show confidence in the people at the outset. I may mention that the friendly chiefs of Bravah, when bidding me "God's speed," had cautioned me not to go in-shore at Merkah or Makadishó; and this evening the two Bravah guides (who had been abused and threatened by the Merkah townspeople for bringing the Feringís, as they say) earnestly begged me not to go—one trembling, and literally crying, though twenty-one years old. He became more composed, however, when I told him that he need not accompany me. The river is represented to be 3 hours off, which is about 9 or 10 miles. I have settled to start early, and purpose returning before night.

5th.—My safe return has caused much joy in the town. All the people were out to welcome me back: the women and children on the tops of the houses, and the men, to the amount of two thousand, advanced nearly a mile from the town. The principal cause of this excitement appears to be, that they apprehended the slaves, or rather self-liberated free men of the interior, would treacherously intercept my return, and then they themselves would suffer from the ship. The time of day, however (near sunset), favoured this demonstration of feeling. When first, from the brow of the hills overlooking the town, I descried the multitude advancing, I was rather uneasy, and so were my companions, who instinctively stopped a few minutes, and consulted. Proceeding at a slower pace, we soon distinguished that the people were unarmed, and that mere curiosity had led the greater number from their houses. But it is necessary to detail my journey. Not being able to get away before 7 A.M., instead of 5, as I had wished, about one hundred men collected, and accompanied myself and my guard of nine men to the suburbs. Here the other Brava guide faltered in courage, and pretty plainly said he could be of no use, and did not wish to go on with me. I immediately sent him back to the town, thereby placing myself wholly in the hands of the Sómáli guards. I carried pistols, sword, and gun; and selected the man who appeared the chief as my companion, keeping him in conversation by means of Arabic, and we walked together nearly the whole way.

Leaving Merkah, which is a stone-built town of about 3000 inhabitants, evidently founded by Arabian traders, we proceeded over the sand-hills which back the sea above this place as elsewhere. On arriving near the summit, at about 200 feet elevation, and 1 mile W.S.W. from the town, we found excellent water 4 feet from the surface, in half a dozen places. Looking down on the country beyond, it presented every evidence of great fertility, and some degree of industry. Green Indian corn and millet were waving to the gentle land-breeze; other patches of cleared ground showed that the labour of the reapers was over for a season. Grain, I was assured, ripens all the year round, yielding from 80 to 150 fold. The harvest-home of the slaves is here kept up by singing in procession through the streets of the town, a few dancers preceding: it ends by a feast and presents from their masters. After passing over the soft and sandy surface of the hills, we descended to the lower cultivated ground, and soon came to some labourers. I stopped to watch their labour; they were thrashing the grain; the heads of the millet had been plucked by women and children, and brought on asses to a cleared, hardened spot, protected from cattle and dust by a circular hedge formed of the prickly branches of the acana, mixed with the straw of the grain.

When the space was sufficiently filled with the heads of grain, strewed 3 or 4 feet deep, thirty or forty persons with flails, sticks slightly curved at one end, commenced the thrashing with their faces turned outwards; they worked away, treading and thrashing until they met, back to back, in the centre of the circle, when women and children collect the stalks and winnow the grain in heaps, merely waiting for the usual sea-breeze to scatter the chaff as they toss it in the air; it is then packed in baskets of a particular form, and supplies the whole coast of Hadramaut and Omán. At about 5 miles from Merkah, there were large herds of cattle, which pastured over vast tracts. Here I saw an instance of the severity with which a runaway slave is treated. One who had thus offended was fettered with shackles on his legs, and had been so for three years. He could advance only 10 inches at a time, and was condemned in that state to carry water to the labourers at a distance of 4 miles from the well. He was offered to me for 20 German crowns (about 4*l.*); but I declined purchasing him, without assigning any reason. There were many thousands of men employed in cultivation here; their only shelter is formed by the loose stalks of the common millet piled up in a conical shape, and allowing three or four persons to sit together in the interior. They are thus screened from the sun, but exposed, of course, to the rain, and whole families thus pass their lives. On surmounting a slight rising, the course of the river could be traced by a line of large trees along its banks; the green of the country was refreshing to the eye; all was verdure or ground lately reaped: the country, at a distance, was pretty well sprinkled with trees. At 11 A.M. we arrived at the village on the banks of the stream. Here I first saw the neat conical-roofed house of the natives, of which the village consisted of about 100. This hut is superior to a mat-hut both in external appearance and in the skill displayed in its erection. The village had a wall of piles driven into the ground, close together, and having a height of about 4 or 5 feet, in addition to the close hedge of prickly pear planted in on the outside, and proving no contemptible defence. The wall had two narrow openings without gates. The heads of the village came out to meet our party, increased on the road to twenty-two spearmen; one man was deputed to secure for us a peaceful entrance. While we halted, curiosity and merriment awaited me from the fair portion of the inhabitants; a sheep was killed and milk produced without being asked for. The stream is here 150 feet broad, its surface being only 2 feet below its banks, though they say this is the dry season. I passed three hours on the banks of the stream, under a large fig-tree swarming with birds of the most brilliant plumage, principally a kind of yellow sparrow. There were three cocoa-nut trees in full bear-

ing and two large fig-trees in the village; even the ever-waving leaves of the lofty palms were clustered with birds' nests, so much do the feathered tribes here court the neighbourhood of man. There is a ferry at this place, consisting of a single boat, untaulked, made of six rough-hewn four-inch planks, rudely tied together, something in the form of a large open chest; the rope was a fibrous creeper from the thicket, knotted in twenty places. By this boat I crossed the river, and walked some distance in the country on the opposite bank of the stream, but found it an entangled thicket of high rank grass and stunted trees. The depth of the river I ascertained to be 17 feet, with a current of 2 or 3 miles an hour, the hippopotamus and alligator being its larger occupants. The natives use both traps and a rod and line for catching fish. The inhabitants looked healthy and clean, and were particularly merry and cheerful at my expense; when I took off my hat it created a burst of laughter—they had never seen a Feringi before. No instance of ill will was evinced towards me; I took pains to show them everything at all curious in my possession, whenever they inquired about it.

On returning, three head men accompanied our party about a mile outside their village; and, uttering a benedictory prayer, to which all responded, we separated in peace. There is no doubt that this river is the same as that near Bravah; it carries down a reddish fertilising soil, the surface-water being copiously impregnated with it; fuel is abundant on its banks. The guard, on returning, were more friendly and communicative than in going; they halted several times out of consideration for me, though I bore the fatigue as well as most of them; we returned to Merkah before sunset, thus travelling 20 miles and upwards since morning. So far I am satisfied of the existence of a river of which the stream and body increase in force and volume as we advance northwards; the compass-bearings and observations are embodied in my plan. I gained much information from various classes of natives at Merkah, and also succeeded in obtaining some knowledge of the routes and tribes of the interior from two natives of Berbarah (the Sómáli port directly opposite to Aden), who had but lately arrived with a few head of cattle and sheep for sale, carrying back cloth and tobacco.

6th.—Having taken in 2300 gallons of excellent water from a well 100 yards westward of the town, and 200 feet only from high-water mark, we started for Makadishó.* The natives assure me there is considerable waste of river water by its percolating through the soil and running into the sea at many places between

* Makdishó, or Makadishó (pronounced Magadashó, Magadashó according to the Portuguese spelling), مقادشور in Abd-l-fedá's Geography.

Bravah and Makadishó: excellent water is certainly everywhere abundant on this coast.

The current was still adverse or to the westward. Passed several "beders," or the peculiar Arab trading-boat of these parts, carrying cargoes of slaves to Omán. They usually put in here, as it may be styled the grain coast for the supply of Southern Arabia, to take in a cargo; the profits are enormous, 300 and 500 per cent. in a passage of 15 or 20 days. They come down, however, in October with their dates and cloth; employ their boats for hire to carry slaves to Zanzibár, to bring wood for building, and in fishing, and only return to Arabia early during the S. W. monsoon. From Merkah to Makadishó the range of sand-hills still continues, rising more or less abruptly from the beach: the various villages between these ports are entered on the map. The coast has a barren aspect from the sea, but beyond the sand-hill range all is covered with luxuriant vegetation.

7th.—Anchoring at Makadishó in the forenoon of the 7th, one of the guides was landed to inform the Sheikh that I would wait on him; he said he would meet me. Having heard at Bravah and Merkah of Makadishó as a most treacherous place, and dangerous even for a person to land at, I thought display might have a good effect, and ordered the marines to accompany me on shore. The boats were accordingly manned and armed, and when at the back of the surf, a salute from the launch's gun was fired in honour of the Sheikh; the beach was crowded with armed men. I had procured letters of introduction from the Sheikhs of the Merkah tribes, in addition to the one from the Imám of Zanzibár, and was not disappointed in a most friendly and even warm reception. The chief presented me with a bullock, and an Arab merchant, a sherif, offered me a lodging, and invited me to stop on shore.

Makadishó, once the capital of a kingdom, is now half in ruins; it contains 3000 or 4000 inhabitants, Sómálís, with perhaps thirty families of Arab origin. Here the Sómálís are residing in substantial stone houses that neither they nor their fathers ever built. Four watch-towers, or perhaps belfries, with interior spiral steps of superior construction, evince the former reign of the Portuguese;* but their remembrance has passed away from the present generation. One building, which was evidently a church or chapel,† with its aisle and chancel, contains a black marble slab, bearing an inscription recording the piety of a sherif who repaired it, and dedicated it to Koranic devotion, the worshipper modestly saying the deed was undertaken in hopes of meriting heaven by

* This is an error. The Portuguese never possessed Makadishó: these buildings are of Arab origin.—F. S.

† A mosque rather.—F. S.

its performance. The town has a ruinous neglected appearance from the offing, and on entering it, the filth and poverty which present themselves are both distressing and offensive. Hearing that the river before mentioned rolled by in the neighbourhood, I determined to remain on shore and prosecute my inquiries. The house of the burly sherif, who would match in port and appearance with any fat priest in the world, is three stories high, flat roofed, with dark narrow stairs, but capacious rooms, and might, if kept clean and furnished, be made a very tolerable dwelling; the windows were small, some had Venetian blinds, all wooden shutters, the only furniture being hides stretched on wooden bed-frames, and a strong chest. An arrangement was soon effected with a messenger to carry a note to the chief residing on the river, with whom I sent one of the Bravah guides, telling him I had a present for the chief, who was described as a pompous man, very vain of his learning and reputed good fortune. Returning on board the following day—

8th.—I made arrangements to land 15 men with muskets to accompany me as a guard, following in this the advice of the Sómali chiefs of Merkah. Aware as I am that there is considerable responsibility incurred by me in taking an armed force on shore, I now record my motives:—1st, Security to my own person in carrying out the wishes of my superiors; and 2nd, To establish British influence with the natives of the interior, as nothing but some display of force can effect these objects. The people here, that is the present generation, have never (with a single exception) seen a white man; there is only a record of three having landed at Makadishó; all agree in saying that the Sheikh of the interior and his people have never seen one. The guide having returned with the chief's written permission for me to proceed, I landed, but the surf being high, I was obliged to order the other boats back. I found 10 spearmen had been sent down to accompany me back to the Sheikh; they had been six hours coming, so I hope to go there during one night, and return the next.

9th.—No communication with the ship; the surf very high.

10th.—In the afternoon Mr. Metcalf went off in a large native canoe, and although swamped in the surf, succeeded in getting on board the ship; rain came on heavily, which allayed the swell somewhat, and the boats landed in the evening with 7 European musketeers, and 7 sepoys;* and I prepared to start at once, being accompanied also by Messrs. Robinson and Metcalf.

14th.—Returned, having completely effected both the objects I had in view; and having walked up the banks of the river, now increased to a noble stream, for 10 miles, and visited 6 consider-

* Sepahis.

able villages: we were detained by the absence of the Sheikh one day and a night, and the fatigue the men experienced made a rest of 36 hours necessary; the sepoys suffering more than the Europeans. The distance, 22 miles, was greater than I had supposed; but to give a detail of the journey:—*April 11th*—Quitting Makadishó at 6 P.M., with 10 men of the town to carry necessities, and 10 others, the guard from the Sheikh of the interior, besides the party from the ship consisting of 17 muskets and 3 Arabs, a guide, the ship's pilot and interpreter, we pushed on with short intervals of rest till midnight, when the guide recommended a halt near a supply of fresh water. The plan was for the Europeans to accompany me immediately after the guides, keeping all together, and the Naik and 6 sepoys to bring up the rear of the baggage-carriers. At 4 A.M. on the 12th, started again, but were overtaken with rain before daylight, which wetted us to the skin; we were all on foot, and the mud began to be very deep. As soon as the guides could see the way, we pushed on till within a mile of the town; halted to put the arms in order; all right but one musket. Entered the town just at 8 A.M. and fired a salute of three volleys in the presence of about 7000 spectators. Having crossed the river in the ferry-boat to enter Girédi, the capital of Sheikh Sultan Yúsuf bin Mohammed, as he styles himself, I requested permission to have a house given us for dressing in, as we were wet; when four very tolerable houses were given up at once; they were circular, with conical thatched roofs, as before described. After refreshing ourselves a little, I sent to say I was ready to receive the Sheikh, who had been importunate to come and see his visitors, sending several times to know if we were ready. When he came, I excused myself from using any ceremony, as we were all tired; he said he was honoured by the visit, the town was ours, we might do what we liked, &c.; and remaining only a short time, said a bullock had been killed already, that anything I wanted, I had merely to mention it, myself and party being his guests; and he kept his word very fairly while we remained, sending us milk, rice, and a sheep every day, his own people cooking for us. We returned his visit in full dress in the evening, the party under arms, and fired a "feu-de-joie" at his door, having a boat's red ensign displayed. The chief is a tall man with an intelligent countenance, about 45 years old, dressed only in a large white cloth loosely thrown round his person, and brought over the head and shoulders so as to envelope the whole body from the ankles to the crown of the head; he wore sandals, and had a small spear in his hand, and the eternal tooth-brush stick usually used in Africa (it is the stalk of the *Salvadora Persica*, Rák of the Arabs); his head was shaven, and he had a scant beard round the edge of the lower part of the face; the mustachios, the imperial, and all stray

hairs of the cheeks being carefully plucked out by the roots ; such being the universal custom with the Sómálí nation, to which this chief belonged. Judging by him and the principal people here, the Sómálís are not a thick-lipped race ; they are black, with crisp hair, straight noses, and well proportioned heads, features, and limbs ; in the lower order there is so great a mixture of the slaves and Gallas, that it is impossible to distinguish them from each other. As the noble-looking chief watched the " present arms " of the musketeers he was evidently discomposed, his eye anxiously flitted from one soldier to the other, and he, no doubt, felt relieved when they were marched off. I had presented him with a pair of percussion pistols, an English carpet, several yards of blue broadcloth, an Abyssinian chief's cloth of very fine manufacture, a silk turban, &c., and asked him for permission for all Englishmen to trade, reside in, or travel through places subject to his authority ; he gave his immediate full consent in the presence of two other natives. I requested him to give me a written paper sanctioning the free entrance of Englishmen into his country ; he promised me one, with the exception, however, of " Galwen : " in excuse for this, the chief said his authority was not properly established there ; when it is, he added, " the English shall have the town." I told him, " We do not want it, in our country strangers go where they like." He has two brothers living, one leads in battle, and is a talented man, both in intrigue and war ; the other is not remarkable in any way, except in partiality to Europeans. The following day the chief asked me to assist him in war ; this month he sets out on a most important expedition, hoping to crush the chief of Bardérh. The whole of the Sómálís are enraged against that chief and the people of Bardérh, as they stigmatise the natives as Káfirs, first, because they allow their women to walk about the streets with their arms and faces uncovered ; secondly, because they use tobacco ; so to prove they are not " munáfik," or " hypocrites," but " moslems," or " faithful," the whole country is about to follow at the heels of Sheikh Yúsuf in order to annihilate the fanatical tribe of Bardérh, and burn their villages to the ground.

The people of Bardérh have often provoked a crusade of this sort by their aggressions and plundering propensities, under the specious pretence of reforming the customs of the unorthodox. The Arabs of the sea-ports like the Bardérh chief best, as he respects their sherifs and sayyids, and adopts Arab customs. Sheikh Yúsuf also asked me to level the rebellious half of Makadishó, reasoning thus :—" How can you do wrong ? Is it not mine ? and you have my permission. We have made friends. The chief and people of Hamérwen (as it is called) are my enemies : they are your enemies." I explained to him that though

his permission was given, I had a sovereign whose order was necessary before I could act as he wished; that we English act by orders. "Who is to order me?—You can only permit." This conversation explains how it was he used her most gracious Majesty's name in the written paper attached.* I am not responsible for the style or manner of its insertion. The chief's brother made me a private visit, and proposed to me to assist him, and land with 100 Europeans at Mingmá (Minguyah?), and establish it as the grain-port of this coast. I conceive this was not asked in sincerity, but was said merely to ascertain my object in wishing to see Galwen. The chief came over to my quarters the day previous to my leaving his town, and remained for three hours, conversing very familiarly, asking questions indicating a great desire for further intimacy with, and information regarding, Europeans. Everything I had, to the knitting of a stocking, I explained as carefully and clearly as I could. The lion's head on the hilt of the uniform sword struck him as so peculiarly appropriate, that he harangued the bystanders for some minutes on its emblematic meaning. His own shoes were of camelopard's skin; his dress of cotton, the growth and manufacture of the country; the amulet he wore round the right arm was very neatly plaited of narrow strips of the delicate skin of "Salt's antelope," stained a dull red; his food is milk and fresh meat, with stewed coffee and millet in the morning. No Sómáli eats flesh, unless he has lost all self-respect; many do not learn to eat even grain. They are essentially a pastoral people.† The chief and his two brothers, Sheikh Músa and Hájí Ibráhím, are all 6 feet in height, or upwards, well formed, with aquiline noses, fine lips, but crisped hair.

During our stay there was a holiday on account of a zigára (pilgrimage), or in commemoration of a saint. The amusements of the people were rational and pleasing: dress, music, dancing, singing, and feasting. The dancing almost seemed a sacred duty. In many instances grey-headed men, with the peculiar dress which hájís wear among this people, joined with gravity and slow but measured movement in the rejoicings. No arms were seen: the usual spears were laid aside for the drum, wooden cymbals, and to join the dance. The rude music was aided by the voices of a choir of women to each set of dancers: the occasional swell of the united voices was really fine. I became a spectator for two or three hours before dark, and stood by the largest knot of people. There were twenty sets of performers, each with perhaps 300 by-

* Forming part of an Appendix to the Journal, and transmitted with it to the authorities.—Ed.

† That a pastoral people should not eat meat is somewhat extraordinary; and, if they do not eat grain, it is to be regretted we are not told what they do eat.—Ed.

standers. Men and women joined in the dance together, crossing from side to side. There did not appear to be any choice of partners: anybody entered the ring to contribute to the exhilaration; all was smiles and perfect enjoyment.* The women cover their breasts by means of the end of a second cloth brought under the left arm, and carried over the right shoulder, and tied to the girdle. A handkerchief envelopes the hair, no part of which is seen. The housewives of this community do not use a needle—no part of their dress requires it: thus the fair are clothed as much as the women of India; and, to judge by their liveliness in the dance, and their really keeping time in musical efforts, they hold a more rational position in the Sómálí society than they do among other Mohammedan nations, allowedly more civilized in most respects. Finding I attracted much notice, and was the cause of scolding between my guide and some few of the more enthusiastic dancers, whose performances were neglected for the more novel sight of a Múzungu, or European, I retired to a rising ground not far off. If the reader could imagine himself beside me, he would partake of the agreeable feeling with which I yet regard the time I spent in watching the overflowings of joy and the exuberance of spirits displayed by the masses of human beings congregated between me and the noble stream, a few hundred feet distant, overflowing and ever blessing where it flows; and, under God's providence, the principal cause of this people's present happiness, ensuring abundance with very moderate labour. I looked down on 5000 or 6000 men and women, who alternatively kept up their music, dancing, singing, and processions till daylight next morning. An Arab would be stung to the quick, and scandalized, by witnessing this spectacle among a professedly Mohammedan population; indeed, my Arab guide, when I appealed to him whether the Bardérh community would stop these amusements, replied, with indignation and flashing eye, "It is better that this people should die, than women thus be suffered to dance with men." At least 10,000 men have fallen in war, within five years, to determine this important question: the men of Bardérh were in the last fight successful; Sheikh Yúsuf hopes, however, this month to exterminate them.

The sovereignties of corresponding latitude on the W. coast of this great continent are of that bloody, despotic description which savage nations alone submit to. Here the government is mild, though, by a moderate computation, deducting three-fourths of native accounts, this great Sómálí chief could bring 20,000 spearmen into the field, perhaps 50,000, if he made large promises

* If these people are Moslems, it shows how they have engrafted their Pagan usages on Islám. The Turks hold dancing almost in abomination.—F. S.

to and flattered the more republican-spirited districts, which nominally own his authority, and are certainly not under the dread or influence of any other Sheikh.

The supreme power has been hereditary for several generations in the present chief's family, and his authority is very firmly established: if successful in his projected expedition against Bardérh, he will command the whole province from the Jubb to the Haines River. There is every probability of his success; if defeated, he will lose his influence over the sea-coast as far as Merkah southwards, and also his authority at Gaúaneh, the frontier station towards the Gallas of Lievin (Leinmu?), as the Bardérh robber formerly extended his reforming arms to those places. The Sultan of Bardérh was successful in his last attempt on Bravah, extorting 500 dollars, or so, and driving off cattle; his soldiers defeating twice their number of Bravah Sómálís just outside their town, and killing perhaps 200 of them in the route: this occurred three years ago. Dancing is given up at Bravah, and the women wear veils and shirts. Tobacco is used only in secret. Sheikh Yúsuf, in revenge, burnt three villages that adhered to Bardérh; and would have proceeded with force to restore Sómálí customs to Bravah, but the townsmen very reasonably said, "We will return to our late customs most willingly, but when you are absent we cannot resist the power of Bardérh; it is the part of a great chief to conquer the author of our present apparent want of allegiance to him." This representation, accompanied by a trifling present in goods and money, about 200 German crowns, soothed the mind of Sheikh Yúsuf, and he withdrew to Yaredi; he has ever since been talking of exterminating the Wahhabi horde of Bardérh; but they have increased in numbers latterly, as they are continually plundering the Wardai Gallas on the opposite bank of the Jubb.

This is the state (as before mentioned) he so earnestly pressed me to assist him in subduing.

To finish this branch of politics, I may refer to the rebellious position of one-half of Makadishó under the nephew of the hereditary chief. A few months ago Sheikh Yúsuf descended with some eight thousand men to settle the dispute, but being appealed to as umpire by both parties, gave his advice, and refused to act, seeing the affair would be bloody and doubtful. For this moderation on his part, as it is usually regarded, he has received much applause, but the secret history of his failure is, that he had reason to doubt whether one-half of his rabble soldiery would fight against the inhabitants of Hamerwén, as, being of the same tribe, no captives could be made of women and children, and cattle there were none. However, when requesting me to bring about peace at Makadishó, he said that no firing would be neces-

sary, only to threaten, and they would submit. This chief has a great idea of maintaining the character of being fortunate in all his undertakings, and, by exaggeration, to affect the imagination of his subjects; as an instance, he said I had given him the richest merchandize of India, and should receive every honour, and ten bullocks to carry back to the ship; I only saw two.

13th.—The day after we arrived at Girédi we set out early to explore the neighbourhood, Hájí Ibráhim, the Sheikh's brother, accompanying us. Following the sharp angular windings of the stream (each reach is seldom more than a mile long), we frequently saw the hippopotamus basking in the sun, or under the shady banks, in numbers together; when disturbed by the discharge of a musket, they uniformly swam against the stream, advancing by a succession of dives, as it were, throwing up their hind-legs above water, as the porpoise does its tail. Their foot-marks were numerous for a considerable distance from the banks of the river, and the natives represented them as very destructive to their cultivated grounds. The alluvial soil of the river extends to the sea-beach, indeed the valley on the left bank of this river is a vast alluvial tract: on the right or continental bank, circumstances did not admit of my proceeding more than a mile or two. In the neighbourhood of Girédi both banks were cleared, and under cultivation. The wild fig-tree was clustering with very savoury fruit, which is in great abundance; the ground, where not subject to the hoe, produced wild flowers of much delicacy of tint; and brushing through the shrubbery under the spreading fig-trees, aromatic plants diffused their odours of an almost startling sweetness. The fig-tree affords timber for ferry-boats, but is only suffered to stand on the very banks of the river, all other ground being cleared for millet and Indian corn, and here and there the sesamum is raised with care and trouble; the castor-oil nut-tree is wild. I had not an opportunity of ascertaining the revenue, if any, which the Sheikh derives from the labour of the people. He appears to expect presents from merchants and strangers visiting or passing through his country. His warriors have no reward but plunder, and no stated provisions, even when in the field. The poisoned arrow is used both in war and hunting, but among the inhabitants settled in communities there are few archers, compared with spearmen, perhaps three per cent.: the only men armed with bows and arrows that I met with (about twenty) were uniformly young, and very short in stature.

A good opportunity was afforded me of judging of the amount of population, as whenever we approached a village our guides urged us to discharge our arms to astonish the natives (to use a trite expression, which cannot be more appropriately applied). These people are essentially good-natured; they would submit

their heads for examination like children. Some young fops among them dress their hair most tastefully, or at least elaborately, approving very much of our naval cocked-hat for form; or sometimes bag-wigs and mops in turn receive the same approving imitation: none but the interweaving curled hair of the negro could maintain the form into which they arrange their heads of hair. The neck-support, which is universally carried by the men when absent a few hours from their houses, supports the head comfortably five or six inches off the ground when repose is desired.

The campaigning or travelling kit of a Sómáli spearman is as follows: one cloth of cotton, 6 yards long and 2 wide, sandals of giraffe's hide, which are found to be light and very durable, a calabash of water, a neck-support, a quantity of tobacco, a pair of tweezers, and a tooth-brush, carried in a leathern bag slung close under the left arm; two spears, a shield, and sometimes a knife, complete his equipment: of the spears one is usually small and light for throwing, the other broad and heavy, which is never thrown. All the manufactured articles are from their own community. They depend on India for cotton in its raw state; on Arabia, in a great measure, for coffee in the husk and for dates; and on all countries for tobacco, which they cannot do without.

The returns are grain, gums, hides, ivory, rhinoceros's horns, and hippopotamus's teeth; the value of the latter is little known; the natives took us to see the carcass of one that had been dead four or five days; his tusks were removed before our eyes, to be sold to us, and but for our visit they probably would not have been touched. The double-horned rhinoceros is very common; a fine specimen was purchased for $1\frac{1}{2}$ rupee; it had only just been brought in, the hide about the root of the horns being quite fresh.

The continued windings of this stream would make it tedious to ascend in a steamer; the appearance of the banks would, I have no doubt, be an excellent indication as to the side where the deepest channel would be found; the water during this season was turbid at each place of the river visited, a rich red loam being held in suspension; the natives, however, stated it sometimes ran by quite clear, but I could not ascertain under what circumstances. When in the villages some miles from Girédi, I found the behaviour of the people, old and young, to be most pleasing and natural; everywhere curiosity, good humour, and hospitality met us. If milk, pure and new, could hurt one under exposure to the sun for hours during its meridian heat, I and those with me ought to have suffered. As I had determined to see and to be seen as much as possible, to leave a strong recollection of our visit, I travelled about more than was quite agreeable; but the novelty of adventure and general kindness of all classes of the people

was more than a recompense. Several opportunities offered of making trifling presents for considerate voluntary acts, which excited good feeling on both sides, and made the Company's rupee known as a coin in a part of the world where it never had been previously introduced. I did not forget to explain whom the stamped head represented, and hung several round the tawny necks of the daughters of the land in return for bowls of milk and honey they were all forward to present us with.

We offered 4 dollars to the natives of a village about 8 miles, by the river, from our habitation at Girédi, to take us down by water; but after a consultation the people said, "You want to shoot the hippopotamus; what if a wounded one attacks the boat, and you are all thrown into the river?" This would indeed be a Mungo Park's fate! I did not press the point; more money would probably have overcome their scruples, but I did not try its effects, and quietly crossing the river, we returned by the opposite bank to our dwelling. We saw a family of monkeys, two or three old ones with bushy manes, and many younger ones of all ages; they were of a large brown sort, standing as high as a mastiff; the fowling-piece was more than once presented at the larger ones, but each of us in turn dissuaded the other from firing, as in case of being wounded they cry so touchingly. The natives are delighted with the sound of fire-arms and urged us to fire, saying the monkeys pluck the beads of Indian corn, &c.

Ant-hills and the wild bees' nests were frequently met with; the burying beetle, lizards, the chameleon, and birds' nests pendent from the branches of trees over the stream, were numerous; the hues of the birds are beyond description—brilliancy of colouring does not convey an idea of the ever-varying richness of the tints of their plumage—as they gleam in the sunshine. The whole country is of the richest soil; indigo, cotton, and sugar-cane would no doubt thrive; but the inhabitants say, and perhaps truly, "Were we to have all these things, the Arabs would take our country from us."

As the river on whose banks I am now standing has no native designation, nor any general name among the Arabs, I take the liberty of introducing it to the scientific world as the "River Haines," or "Haines River," as a small tribute of respect to Captain Haines, whose unremitting zeal for the advancement of geography, and established reputation as an able man and scientific officer, will justify me in thus testifying my personal esteem and regard for him.

With regard to the Jubba, I have appealed to natives, who have been in the habit of visiting that river at Ganáneh, and their testimony concurs in representing it as twice the width of the Haines, or about 500 feet broad, and that in the driest season

(i. e. in February and March) it is fordable; but when the rains commence, or towards July, it is very deep. I beg to repeat, I am assured that Ganáneh, as well as other principal villages, for convenience is situated at or close to a ford, i. e. at a shoal part in the river's course.

The villages here, at the distance of a mile or so, embowered in lime and fig-trees, from the conical shape of the huts, bear a striking resemblance to a cluster of bee-hives; the style of the hut, which I have only yet casually mentioned, is of the Timbuctoo character, not of the pastoral Sómáli (bent twigs covered with mats or hides), but supported by a stout central post, the roof is neatly thatched with grass terminating not in a point, but at a ring of twigs three or four feet in diameter, under which two or three rows of a particular matting is put, which shuts the top and keeps out the rain. About 8 feet down the centre post, rays are thrown out as a further support to the roof, the lower ends resting in niches cut in the post; the circular wall, which is about 6 feet high, is formed of two rows of small posts at about 10 inches apart, each row being intertwined with the rope-creeper, as it may be called; they form two concentric rings, the inner one being highest, enclosing a space about 18 feet in diameter; the interstice of the rings is then filled with clay from the river, which hardens tolerably, both outside and in, is smoothed and plastered over with the whitest clay they can get, which adheres firmly, and preserves its whiteness inside somewhat, but the weather and rain turn the outside brown. The house has only one door and no window; the interior is divided by a mat or hide partition for the privacy of the women; pegs are used to hang things on. Bed frames and earthen pots from Kutch are their only utensils besides the hand-mill and grain-mortar of India. I can testify that these houses are delightfully cool, and not so dark as might be imagined; there are generally two or three houses in one enclosure; and the habits of the people are certainly more cleanly than those of the natives of the sea coast. The population is rapidly increasing, and the people have every appearance of being well fed. Disease is very rare amongst them; no peculiar one was noticed. They reach a Macrobian age almost; men of seventy, stout and healthy, go on fatiguing journeys, and the resident Arabs speak in raptures of the genial climate and the abundance of all things. They certainly bear their age well.

In this delightful region all of us felt an elasticity of spirits which will not soon be forgotten. The fatigue of returning to the ship, though encountered in the day from motives of prudence, was not attended with any injurious effect, except a few colds from drinking large quantities of water when hot and perspiring; the

Europeans again on returning endured fatigue better than the Sepoys. On approaching Makadishó, we found our guides and guards were anxious, as I had insisted on returning by the shortest route, though it led through the territory of the hostile half of that town. We met several men of the opposite party, but we were too strong for them to do more than growl at us; on coming to wells, the people being of the adverse party carried away all the hide buckets and ropes, and gesticulated violently, forbidding our approach; but thirst was rather more powerful as a motive than the anger of a weaker party as a restraint, and we took possession, to their annoyance, of the jars they had been employed in filling for their households; seeing this, they brought back the buckets. This people are very susceptible of improvement; the chief interested himself to learn the mode of using the percussion pistols the very day he received them; whereas the Belúche Kilahdao of Mombas declined accepting the same pistols from their novelty.

Punishments are inflicted according to Mussulman law; compensation is generally received, even for a murder, by the relatives of the dead, but when refused, an extraordinary mode of strangling is sometimes practised; at others, the spear or knife does the business. The strangling, as I am credibly informed, is thus effected:—relations of the deceased claim a right of revenge from the elders of the community; the elders repair with the nearest relations, and sit down at the door of the murderer, who is solemnly reminded that blood is legally demanded for blood; he requests time to pay his devotions, and then sits inside his dwelling, and cries he is ready; the relations of the deceased then enter the house and close the door; having prepared a lever of wood and a rope, the latter is passed under the jaw, and brought over the ears to the crown of the head, and fastened to the lever, which is used as a wrench to break the unfortunate man's neck; it is described as a horridly slow mangling method.

The only thefts we experienced were the loss of a silver fork, and buttons from our uniforms, which were supposed to be gold. We heard of a highway robbery, which took place when war existed between the two towns; an Arab merchant was the victim, who lost his property and his life by rashness. It is singular that the murderer of this man was at Merkah the day I proceeded to the river, and was violent and threatening in his language, even saying, "If the Feringi has been to the river I will kill him," &c. This one of the Bravah guides heard, and the bystanders tauntingly told him the Feringi was surrounded by the sultans, or sheikhs, whom he must first deal with. His vapouring was subdued a little by this announcement.

The chief of Shingam, the northern half of Makadishó, named Imám Ahmed Imám,* I fear may throw difficulties in the way of others wishing to traffic in or visit the interior from the port, as he expected large presents from me; but, as gifts were not necessary, I made him a suitable acknowledgment, which however he was dissatisfied with, I heard, expecting more. He is entirely under the interior chief's authority, and therefore need not be propitiated. I sent to the rebel a very civil written message of amity and good-will, in return to a letter he addressed me, urging an interview. I did not go over to visit him, as it would be recognizing two chiefs to a small town, and probably aid in establishing his authority, in opposition to that of his uncle, which I had no reason for doing, as the latter had complied with all I had required of him.

At Makadishó, called Hanir by the Sómális, I fully ascertained that the natives of the neighbourhood where the bugalo was wrecked had not been guilty of plundering, or any outrage on the occasion; and that what property was saved had already gone on to Zanzibár, which is all that could be expected. Leaving Makadishó, after a stay of eight days, on the 17th, having taken in firewood, which is abundant, cheap, and good on all this coast, I proceeded direct to Hafún, from whence my report will detail my proceedings.

In recapitulation, I may observe that the first positive knowledge gained of the Haines River was from a native of Zanzibár. I tendered him fifty German crowns, on my own account, to be my guide to its banks; the man remained on board about a week, and then absconded, supposing (I imagine) that my offer was insincere. I subsequently found the detail of his verbal communication to be wholly incorrect, excepting the fact of the existence of the river.

I have succeeded in tracing this fertilizing stream for 110 miles of direct distance; have established a friendly intercourse with the great Sómáli sheikh, resident on its banks; and, I trust, the effect of this vessel's visit to those hitherto unfrequented parts will be to render British subjects respected, and their property secure, under any circumstances. It may with confidence be remarked also that the Jubb is open to English enterprise; the friendly chiefs of Bravah invited me to enter that river in the most friendly manner, offering their services in any way. The effect of my visiting the interior under the auspices of the principal chiefs, must be favourable to future intercourse. I had many secret offers, which, had I been at liberty to avail myself of, would, I cannot doubt, have ensured my safety from the equator to the

* Ibu Ahmed ?—F. S.

borders of Abyssinia. I may remark that, had I lent a willing ear to all the reports of ferocity and bloody intentions of individuals and parties among the people, I should not have gained any positive information at all: but it is a presumption well founded, that the natives of that coast have much greater dread of an European than he entertains of them. To show their sense of his superiority, they not only style him "Kabáíl," but "Koreish" (the name of the most honourable tribe at Mecca); and they are one and all well aware that we are a people who follow "the books," or "holy writings," not altogether Kafirs.

At Galwen alone was hostility manifested. The inhabitants of this place are a community of runaway slaves, of very disorderly habits, acknowledging no authority, but remarkably self-willed, cruel masters. The spot they have selected as a settlement is exceedingly eligible. Among other alarms spread by the mischief-makers amongst them was that the English wanted to connect the river with the sea; and many of the natives' inquiries and remarks evinced a high respect for the superior intelligence of the Europeans. It is said that the banks of the river at this site are much higher than the neighbouring land, which gives force to the representation that we would connect the river with the sea.

Whatever authority the Arabs once possessed, they have long become merchants only in the districts they inhabit; they do not join in the wars of their Sómálí fellow-townsmen, and exert no authority but that of the influence of their name and character as Sherifs. Every Arab, young or old, poor or rich, receives this designation from the credulous and ignorant Sómálí community; they are also the most wealthy in the land.

General Remarks.—The soil of the tract comprised in the map is of the richest red clay, with a little sand on the surface near the sea; not a stone the size of an egg was met with, nor anything like a stone, except the coral of the coast, though authentic accounts of hills 60 or 80 miles in the interior were received. The soil produces plentifully maize and millet, according to the quantity of culture, as also a kind of bean, small and very palatable; also the cocoa-nut, plantain, water-melon, pomegranate, lime, and wild fig, were met with; but there is no doubt that all the tropical luxuries would abound in a very short period if once introduced. The almost incredible quantity of 1300 lbs. weight of winnowed grain can be purchased for one dollar on the banks of the river.

The tame animals are the oxen with humps, camels, black-headed sheep with large tails, goats, asses, dogs and cats. The wild animals are the elephant, camelopard, rhinoceros, lion, leopard, buffalo, zebra, ostrich, porcupine, river-horse, alligator, many varieties of antelope, two species of monkey, and

the civet cat—the latter is occasionally kept in confinement, and its musk removed by scraping once a week; I saw a very large and savage one; it was barred like the wild-cat of Europe, and quite as large. The birds noticed were the ibis, golden or cape goose, the quail, the gigantic crane, the common stork, the heron, smaller cranes of a slate and white colour, two species of divers, the bare-necked vulture, a brown hawk, and birds of every hue, a kind of yellow sparrow being exceedingly common. There are very few venomous snakes, but a great variety of the large class; the boa constrictor, I think, from the description I heard, is common and very large.

The occupations of the inhabitants may be shortly enumerated; the women are the spinners of cotton, wood and water fetchers, and cooks; the men weave, go journeys, and cultivate the ground, although female slaves assist in cultivating it also if not taught to spin. All their domestic utensils and cookery appear derived from India, excepting stewed coffee, which is, I think, *Sómálí* all over.

From the best information I could obtain, the population of the kingdom of *Makadishó*, settled on the banks of the *Haines* and *Jubb* rivers, amounts to 150,000 persons. The *Bon* and *Tidu* tribes, who are the bushmen of these parts, with their small arrows and gross habits of feeding (for besides the flesh of the elephant, camelopard, rhinoceros, and river-horse, they are said to eat the lion), amount to 10,000 persons. The pastoral tracts are described as inhabited by a countless multitude, or "people like the sea for multitude," as the Arabs say. The country is wholly unknown from *Makadishó* to *Hafún*, a distance of 600 miles, there being no record of any European having visited the shore for the purpose of enquiry. Taking this line, and the reported extent of the Mohammedan population of *Sómálís*, in the interior to the country of the *Gallas*, the amount of land may be estimated at 151,000 square miles: native statements raise the population to a million; but allowing for exaggeration we may state it at 250,000, which is a very low estimate. The internal traffic is by camels. They have been supplied immemorially with Indian and *Kutch* goods, through Arab and native Indian traders. The advantage of *Aden* as a mart is again felt in the increasing activity throughout the northern districts, to produce for that market the staple commodities of the land, hides, gum, cattle, sheep, &c.

When the survey I am ordered on is completed, I hope to be able to give with some accuracy, in a tabular form, the result of my enquiries and observations on the portions of the African continent immediately opposite to *Aden*.

Offers have been made at *Bravah* by European vessels, for slaves, at 50 and 60 dollars a head, four times their usual value;

but they met with no success, as slaves are not to be had northward of Mombas. Some of the natives also think themselves bound by their religion not to sell slaves to Europeans, but gain overcomes scruples in this particular.

In passing up the coast to Hafún, I satisfactorily ascertained from an old Mahri pilot, that the coast from Makadishó to Hafún was seldom visited except for water. No harbour is known or mart established; an extensive stream discharges a large quantity of water into the sea 30 to 40 miles northward of Rás-el Khali in the rainy season (July and August), but water is only found in large pools during the other months. The valley of this stream extends for 20 days' journey, or about 240 miles, and supports a pastoral population, whose chief, Haji Ali, has a force of 1500 horsemen, armed with spears and swords. The name of this extensive valley is "Wadi Nugal,"* *واد نوكل*. Two natives whom I took on board as witnesses to determine the dispute about the bugalo wrecked at Hafún, gave me minute information of various routes and the produce of the different parts of the country, in the neighbourhood of their sheikh's power and influence; but hardly complete enough to enable me to add it as worthy of dependence. At Bander Khasim I met with an intelligent young man who had lately performed the pilgrimage and made a commercial tour, including a visit to Harrar or Adhari, which involved some particulars of interest. I give the account of it nearly in the narrator's words.

"In Ramazán (October) I took 25 bahar of gum arabic (of 15 ferazils each) and 3 balális (or jars) of ghi, and embarked in an Arab bugalo to perform the pilgrimage. We reached Jiddah in 9 days; the gum realized 212½ dollars, the ghi 30 dollars. Having performed the pilgrimage and purchased Kutch cloths, I re-embarked. The Nakhdah put into Sawákin, wanting 'rezi,' or millet, for his crew. From Sawákin we went to Zeila, the wind not allowing us to come out to Barbarah. From Zeila I hired five camels, and joined a Káfilah to proceed by land; we reached Adhari, or Harrar, in 7 days: at the first day we came to a river, and for 6 days drank of its water; it was on our right hand. On reaching Adhari, we found the sources of the river; I saw them; the water comes out of the ground with noise. This river is said to be 5 fathoms deep, and is as broad as this ship is long (100 feet). The chief of Harrar, or Adhari (Harrar being the

* Probably *واد نوكل*, Wad Nukal, as *گ* is a letter unknown to the Arabs; but *گ* in most parts of Africa is commonly pronounced much like the Persian and Indian *گ*.—F.S.

name of the country which extends within 2 days of Habesh) is named Emir Mohammed, and is a very just man: the town (of Adhari) is very extensive, with a wall all round, and four gates; it would tire a man to walk round it in one or even two days; it is twice as large as Jiddah, but there are not so many houses or people; coffee is grown within its walls. The Governor and his soldiers are very much afraid of the Gallas who live in the immediate neighbourhood of Adhari. When the Galla Káfila comes, three or four men only are admitted into the town, leaving their arms at the gate. Adhari has lubán (bedivini), or frankincense of the hills in contra-distinction to Java frankincense, which is reputed better, coffee, ghí, hides, ostrich-feathers, myrrh, gum-arabic, and millets. The Gallas come there every day, but never go to Zeila through fear: I remained at Adhari four or five days, and came on with a Káfila to Barbarah, and from thence by sea to this port, 'Bunder Khasim.' I was 12 days from Adhari to Barbarah, and brought down coffee, hides, and habashís (*i.e.* Abyssinian captives), the habashi are Kharistyéni (Christians), to buy and sell; a Mussulman is harám (forbidden): my father gave them as an honour to the Nakib of Macallah, who returned 105 German crowns, or 180." I said, "Have you spoken the truth?" "By God falsehood is harám * (forbidden).

"At Adhari they have a strong fort on a hill within the town walls; from this fort the sea is visible; it is only two days' distance. In coming to Barbarah we were close to the sea for many days. All the people of Adhari are soldiers of the Amin; I do not know how many. The Galla never come to Barbarah, they are afraid too. The tribes from Zeila to Adhari are the Isa and Judabursh; from Adhari to Barbarah, Makabil, Isa, Músa, Abbergabájís, and Hebráwal. The country is peaceful; there is no danger except when there is a blood-feud. Sómálís murder each other, not strangers, or people with whom they have no quarrel. You could go to Adhari—I will go with you. June is a just man. Many hundreds of habashís come from Adhari every year; they are brought there by the Sallís. Cloth, beads, and metals are given in exchange, not money." Such was the traveller's account, which was subsequently confirmed to me in almost every particular by two older natives, whom I held in conversation for a couple of hours on the subsequent day, on shore. At Makadishó I met with a wandering class of men, natives of the neighbourhood of Barbárah, who had visited Adhari, and described it as situated near the sea, at the mountain called in our charts Jebel el Miss (Copper Hills.).

* This was therefore spoken in broken English.—Ed.

III.—*Extract from "A Short Account of Tripoli in the West."*
By Col. G. H. WARRINGTON, H.M. Consul-General at Tripoli.

[The greater part of Colonel Warrington's paper being purely statistical, and containing details already made public in other works, we have extracted those passages only which appear new, and are more closely connected with geography.—ED.]

Desert.—About 2 miles S. of the Town of Tripoli there is a small desert, which extends 20 miles without a blade of grass; beyond this you come to some small oases which increase in vegetation, till you approach the mountains, where the herbage is luxuriant during the winter, and is capable of supporting millions of sheep; but much depends on water, and, although to be had, few wells are sunk.

Mountains.—The Tarhûna Mountains are about 45 miles from Tripoli: they begin near Lebida, and continue through this regency till they join the Atlas.

The passes through these mountains may be said to average about 10 miles in length. Their height is about 1500 feet, ascent about 20°. There is no regular flow of water in any quantity; but in winter, and in hard rains, the water rises in 5 minutes, rushing like a torrent, carrying everything before it, and interrupting for a time all passage of man and beast. In the mountain passes the rapidity is awful, and the gulleys and ravines which they have formed are ever deepening and widening. In the plains, the course of the floods is more tranquil. Here the rivers are generally about 70 yards wide, 12 feet deep, and wall-sided. These water-passes through the mountains are separated from each other from 10 to 12 miles, and here and there, at the top, we find a small spring forming a rivulet of moderate size; some of these rivulets have strength enough to carry their water to the sea even in summer, others are lost in the sand. The mountain-beds of these streams are composed of pebbles, but in the plain, the channels are a dark clay-rock or small stones. Sometimes springs will force themselves out, even in the desert, and with force enough to carry their waters to the sea; but this is of rare occurrence. At Duga, on the top of the mountains, there is a warm spring impregnated with iron.

Rain.—We had an unusual quantity of rain from October, 1841, to April, 1842; 25 inches fell, but never more than 3½ inches in 24 hours.

Temperature.—The temperature I have never known to be above 94° Fahrenheit, or below 40°, but this in the shade. I took the temperature of the atmosphere of the spring or well water, of

the rain or tank water, and of the sea, for one month; the following table shows the result:—

The Temperature of air and water taken from the 12th of October to the 12th of November, 1842. The Air excluded from the Tank or Rain-water.

Tripoli Longitude 13° 11' E. and Latitude 32° 53' 9" N.

Date.	Air.	Well-water.	Rain-water. Tank.	Sea-water.	Remarks.
Oct. 12	76 F.	71 F.	73 F.	77½ F.	Air, shade—Well-water 2 feet deep, drawn in a bucket—Rain-water or tank 16 feet deep—Sea-water taken in hot sun at noon.
" 13	76	71	74	77	Temperature of Sea-water taken near the shore in 3 feet water, at 9 o'clock A.M.
" 14	75	71	72½	76	Taken at 9 A.M., Sea-water exposed to the sun.
" 15	70	66	73	75	Taken at 7 o'clock A.M.
" 16	74	71	74	73	" at 9 "
" 17	74	70	71	72	" at 8½ "
" 18	73	70	72	71½	" at 8 " weather rainy.
" 19	73	68	72	74	" at 7½ "
" 20	69	65	75	72	" at 7 "
" 21	77	71	74	75	" at 9½ "
" 22	75	70½	75	74	" at 9 "
" 23	79	72	75	74½	" at 8½ "
" 24	70	71	75	75½	" at 6½ "
" 25	77	75	74	70	" at 11 "
" 26	74	71	73	70	" at different hours.
" 27	76	70	74	73	" at 8 o'clock A.M.
" 28	77	69	74	73	" at 8 "
" 29	70	69	74	73	" at 8 "
" 30	70	64	72	72	" at 7 "
" 31	72	70	74	74	" at 9 "
Nov. 1	72	68	72	72	" at 7 "
" 2	69	65	72	72	" at 7 "
" 3	66	69	71	71	" at 8 "
" 4	66	60	70	70	" at 8 "
" 5	70	69	73	71	" at 9 "
" 6	64	54	70	66	" at 8 "
" 7	61	62	73	67	" at 9 "
" 8	66	64	70	67	" at 8 "
" 9	70	68	70	70	" at 9 "
" 10	71	68	72	70	" at 8 "
" 11	62	64	70	63	" at 7 "
" 12	61	64	68	67	" at 8 "
Mean of 32 days.	71.09	64.7	72.5	71.8	

In an unusually hot day I exposed the thermometer, in the open air, to the sun, and it rose to 142°. I then placed it in the shade in the open air, and it fell to 110°, and in the house (hot wind nearly excluded), it stood at 90°.

Population.—The town of Tripoli contains 12,000 Turks and Moors, about 1500 Christians, and Jews, say 2000: the population of the whole Regency may be estimated at 1,500,000; but no census has ever been taken. Every man carries his gun, and those equal to bear arms may be calculated at 200,000 men.* The natives are better disposed towards Christians than in any other part of Africa.

Districts.—To the westward, 3 days' journey from Tripoli, is a mountainous district, called Gibel (Mountain), belonging to Sheikh Ghúma, who is descended from the family of Ben Gasem (Khasim). This mountain is worthy of mention, and by nature impregnable; it is very high, and nearly perpendicular, and the zig-zag ascent constitutes the strength of its position. The table-land on the top is extremely fertile, producing corn, oil, dates, water, and every necessary for life in the greatest abundance, and equal to the consumption of the whole tribe. Indeed, I have known an army of 30,000 men, belonging to Yúsuf Bashaw, obliged to retreat from this spot, after repeated attacks. For many years an annual caftan was sent by the Sultan to the head of this tribe, but now Sheikh Ghúma has submitted, and is dressed in the Turkish Christian (European?) costume. To the E. of the Gibel is the district of Gharian, a chain of the same mountain, very productive in oil, corn, saffron, &c.; it is situated about 2 days' journey S.S.W. from Tripoli. The natives live in caves under ground. Tarhúna is another district in the same chain of mountains. It is now under Sheikh Abdelhade, son of Maride, who had his throat cut by Askar Ali Pacha. Emsellata is another district, very productive in corn, oil, &c. Seline and Lebida terminate this mountain range. About 130 miles from Tripoli is the valley of Benolid, a rich and productive oasis. The district from this to Teggerly was under the sole command of Abdgellal, brother-in-law to the Emperor of Morocco. He was lately betrayed, and he and his son lost their heads. He rebelled against Yúsuf Bashaw in 1830, and continued a rebel to the extinction of the Caramanly dynasty in 1835, when the Turks took possession. The rebel then became the patriot, and fought for the country which gave him birth, and for the Caramanly flag, under which he was born, and bravely died under the same banner. He was a most intelligent, well-disposed person, a friend to the Christians, particularly to the English;—brave, generous, humane, whose last act was to abolish slavery, and promote civilization and commerce with the interior.

Sovereigns of the Interior.—The reigning Sultan of Bournú is the son of Sheikh Elkanemy. When a child he was a hostage at

* We suspect the number to be now much less.—Ed.

Tripoli: he was afterwards restored to freedom, and sent by me to his country and friends. Jaffer, King of Wadey, was a slave in Tripoli. I obtained his freedom, and sent him, *viâ* Egypt, to his own country. The son of Bedlow is now Sultan of Soudan.

IV.—*Account of an Excursion in Hadramaut, by ADOLPHE BARON WREDE.* Communicated by Capt. J. B. HAINES, I.N.

As you take great interest in all that promotes the cause of science, I beg to communicate to you the brief outline of a journey—from which I have very recently returned—to the very interesting part of Arabia, which on our present maps bears the name of Hadramaut, and being that portion which separates the desert of El Akkaf from the Indian Ocean.

The endeavours of former travellers to penetrate South Arabia have always been unsuccessful from the very strong religious fanaticism which animates all the inhabitants, more especially those of the towns.

Lieut. Wellsted, in his valuable work on Arabia, suggests the propriety of subsequent travellers adopting the Mohammedan costume, the better to escape observation, which I accordingly did under the name of Abd el Hud, and in that disguise I left Aden on the 22nd of June, 1843, and sailed for Osurum; from whence I travelled by land to Makalla. Being afraid of drawing upon me the attention of those inhabitants who are acquainted with Europeans, I hurried my departure as quickly as possible, and left the latter place on the 26th of June for the interior, under the protection of a Bedouin of the powerful tribe Akäbre. The celebrated Wadi Doän was the end of my first journey, which I reached after a march of 8½ days: our stages were generally very short, as we had to pass a ridge of steep hills; the actual time consumed on the road was 49 hours and 18 minutes; the general direction N.W. The first day's journey lay through a continued succession of deep and narrow dales, bounded by bare granitic mountains which elevate their serrated summits about 2000 feet above the level of the sea. A great many chalybeate springs, the heat of which indicated 100° to 130° of Fahr., rose from the sides of the mountains, the waters of which proved good and drinkable, as they contained no trace of sulphur. Although the broken ground of the dales is apparently infertile, yet a great many trees and plants are to be seen luxuriantly flourishing, and which supply sufficient food for the camels of the numerous caravans passing along this road. The traveller too enjoys the shade of the rich foliage of the lofty trees which shelter him at noon from the scorching beams of the

sun. As a perfect calm prevails in these valleys from 10 A.M. till 4 P.M., the temperature rises to the height of 150° to 160° of Fahr. The road passed through many villages, and there were others at a short distance from it. On the 4th day's journey I ascended the mountain of Sidara, which rises about 4000 feet above the level of the sea. The sides of this mountain are covered with aromatic plants: on arriving at its summit I found myself at the foot of two peaks, called Chareibe and Farjalat, which on the right and left rose perpendicularly to the height of 800 feet above my position, and being hardly 10 minutes* asunder, they looked like the colossal pillars of a gigantic gate. Iron-sandstone now appears to cover the before-mentioned granite. The thermometer had fallen, and, after the fatiguing march of the day, the night was sensibly cold. The following day I ascended some terrace-like ridges rising one above the other, the highest of which is named Gebel Drôra. From the commencement of this day's journey I observed the iron-sandstone to be overlaid by a sandstone having a fine granular texture, yellow in colour and very hard. I was now about 8000 feet above the level of the sea, and my view from W. to N.E. ranged over a yellowish plain of immense extent, on which rose every here and there conical hills and ridges. In the E. the summit of the colossal Kar Seban towered beyond the plain. Towards the S. is seen a labyrinth of dark granitic cones, and the view is lost in the misty atmosphere of the ocean. From this point the road continues to follow the level ground, while on the right and left many Wadis meander through the plain in narrow defiles, conveying the rain-water to the lower regions.

At the point where these defiles commence the traveller meets with a few stunted acacias, which afford a little shelter and scanty food to the camels. Every 6 or 9 miles there are cisterns, but neither bush nor village interrupts the monotony of this immense plain. The temperature on this elevated plateau was very agreeable in the day-time, the thermometer never rising above 80° Fahr.; but the nights were intensely cold, the thermometer sinking to 50°. The sudden appearance of the Wadi Doân took me by surprise and impressed me much with the grandeur of the scene. The ravine, 500 feet wide and 600 feet in depth, is enclosed between perpendicular rocks, the debris of which form in one part a slope reaching to half their height. On this slope towns and villages rise contiguously in the form of an amphitheatre; while below the date-grounds, covered with a forest of trees, the river, about 20 feet broad, and enclosed by

* The Baron gives all his distances in time, by which we are probably to understand the time required to walk over them.—Ed.

high and walled embankments, is seen first winding through fields laid out in terraces, then pursuing its course in the open plain, irrigated by small canals branching from it. From the description you will, I trust, form a correct idea of the Wadi Doán, of the extent, situation, and character of which travellers have given such contradictory statements.

My first view of the valley disclosed to me four towns and four villages within the space of an hour's distance. The road that leads down into the Wadi is a very dangerous one, particularly in its upper part; on the right, in some places, are precipices from 300 to 400 feet in depth, whilst a rocky wall on the left nearly stops up the road, leaving it scarcely 4 feet in breadth; and to add to the difficulty it is paved with pebblestones, which, having been constantly trodden by men and animals, have become as smooth as a looking-glass. No kind of parapet or railing whatever has been constructed to prevent accidents.

At Choreibe, one of the towns of the Wadi, I was received with all possible hospitality by Sheikh Abdalla-Ba-Sudan, a man celebrated for the influence he has in the country, and for the reputation of sanctity he has attained. From Choreibe I directed my course towards the S.W. to copy the inscriptions subsisting in the Wadis Uebbene and Maifaah. I was not permitted to visit Nakab el Hadjar, Eisan, and Habalen; I however discovered in the Wadi Uebbene, an himiaritic inscription on a wall which encloses, as it were, the valley. About 6 English miles distant from Nakab el Hadjar I was stopped by a band of Bedouins who forced me to return to Wadi Doán. The country of Habahn was in open insurrection, as the former sultan, Achmed-ibn-Abd-el-Wachet, had been dethroned by his nephew and imprisoned, together with his brother. On the road from Wadi Doán to Wadi Maifaah, at the distance of 3 days' journey, is the fertile Wadi Hagger, where immense forests of date-trees are watered by a continually running stream, that rises 4 days' journey N.W. from the town of Hota. One day further down this Wadi is called Giswuel, and 2 days' journey more downwards it is called Wadi Mefah, under which name it reaches the sea near the village of Bir-el-Hässi, eastward of Ras-el-Kelb. By a more northern route, passing the Wadi Reide-Eddin, I reached Choreibe in 8 days, having been 20 days absent from the town. Wadi Doán changes its name several times; it is called at Choreibe, Wadi Nebbi; from thence Wadi Doán; from Gähdun, Wadi Hajarín; from Hora, Wadi Kasr; and from Kubr el Hud, Wadi Missile, under which name it reaches the sea near Säh-Hud. After resting a few days I set out in a N.W. direction, and a 2 days' long and fatiguing journey brought me to Wadi Amt, which I followed in a northern

direction. It is equal to the above-mentioned Wadi in extent, and resembles it in form and in the proximity of its towns. From Hora, where the Wadi Amt joins the Wadi Hajarín, I again ascended the high table-land, and taking a western direction arrived in 4 days at the town of Sava in the Wadi Rachie. This Wadi is not so populous as the two before-mentioned Wadis, most part being covered with sand. It runs 8 days N. from Sava, above Terim, into the Wadi Kasr. Here I was told that the desert El-Akkaf was only a day's journey distant, and that that part which extends 8 days along its borders to Kubr el Hud, was inaccessible, and was called Bahr el Saffi; that the whole space was full of *snih spots*,* in which anything which happened to fall would perish. The place derived its name from King Saffi, who starting from Bellad Sabba Wadian and Ras el Ghoul, attempted to march an army through this desert, in the midst of which his troops perished. On the following day I set out for that place, in order to convince myself of the truth of the statement which I had received. After a 6 hours' journey in a N.W. direction I reached the borders of the desert, which is about 1000 feet below the level of the high land. A melancholy scene presented itself to my astonished sight! Conceive an immense sandy plain strewn with numberless undulating hills, which gave it the appearance of a moving sea. Not a single trace of vegetation, be it ever so scanty, appears to animate the vast expanse. Not a single bird interrupts with its note the calm of death, which rests upon this tomb of the Sabæan army. I clearly perceived three spots of dazzling whiteness the position and distance of which I measured geometrically. "That is Bahr el Saffi," said my guide to me; "ghosts inhabit those precipices, and have covered with treacherous sand the treasures which are committed to their care; every one who approaches near them is carried down, therefore do not go." I of course paid no attention to their warnings, but requested to be led to those spots in accordance with the agreement I had made with my Bedouins. It took my camels full 2 hours' walk before we reached the foot of the high plateau, where we halted at sunset, in the vicinity of two enormous rocky blocks. On the following morning I summoned the Bedouins to accompany me to the places alluded to above, but they were not to be induced; and the dread of ghosts had obtained such complete mastery over them, that they scarcely ventured to speak; I was therefore determined to go alone, and taking with me a

* The subsequent context will show the nature of these spots. It appears probable, from the author's want of sufficient acquaintance with the English language, he knew of no better term than the one he has used, and which, we believe, means those accumulations of drift snow that are found in the hollows of rocky regions, and into which the unwary traveller sinks.—ED.

plummet of $\frac{1}{2}$ a kilo's weight and a cord of 60 fathoms, I started on my perilous march. In 36 minutes I reached, during a complete lull of the wind, the northern and nearest spot, which is about 30 minutes long and 26 minutes broad, and which towards the middle takes by degrees a sloping form of 6 feet in depth, probably from the action of the wind. With the greatest caution I approached the border to examine the sand, which I found almost an impalpable powder; I then threw the plumb-line as far as possible; it sank instantly, the velocity diminishing, and in 5 minutes the end of the cord had disappeared in the all-devouring tomb. I will not hazard an opinion of my own, but refer the phenomenon to the learned who may be able to explain it, and restrict myself to having related the facts.

The following day I returned to Sava, where I visited a himiaritic tomb, which was only 15 minutes distant from the town. The fanaticism of a Sheikh had unfortunately destroyed the inscription that had formerly existed on the entrance. The next day I started on my return to Choreibe, which I reached after a 4 days' march. Having remaining four days at this hospitable place, I left it in order to visit the country of Kubr el Hud, which historically and geologically is highly interesting; two sons of my host and the celebrated Habib Abdalla ibn Haidun accompanied me. We rested the first night at Grein, a considerable town on the right bank of the Wadi Doân, and on the following day I arrived at Seef, about an hour after my companions who had preceded me.

An immense multitude of people had assembled in the town to celebrate the feast of the Sheikh Said ben Issa ibn Achmudi, who was buried in Gâhdun, situated in the vicinity of Seef. As soon as I had arrived among the crowd they all at once fell upon me, dragged me from my camel, and disarmed me; using me very roughly, they tied my hands behind my back and carried me, with my face covered with blood and dust, before the reigning Sultan Mohammed Abdalla ibn ben Issa Achmudi. The whole of my captors raised a horrible cry and declared me to be an English spy exploring the country, and demanded my instantly being put to death. The Sultan being afraid of the Bedouins, on whom he, like all Sultans of the Wadi, is dependant, was about to give orders for my execution, when my guides and protectors came in haste and quieted the Bedouins' minds by means of the moral influence they had over them. In the meantime I remained confined to my room with my feet in fetters. I was imprisoned for 3 days, but provided with every necessary; on the evening of the third day my protectors came to me with the news, that they had pacified the Bedouins under the condition that I was to return to Macalla, and that I should give up all my writ-

ings. At night I concealed as many of my papers as I could, and delivered only those which were written in pencil, with which they were contented. After my notes were given up, the Sultan wished to see my luggage, from which he selected for himself whatever pleased him. The next morning I set out on my return to Macalla, which town I reached on the 8th of September, after a journey of 12 days, and thence took a boat for Aden.

V.—*Note on the Island of Hong-Kong.* By A. R. JOHNSTON, Esq., H.M. Deputy Superintendent of Trade.

[The following account alludes to the beginning of 1843.—Ed.]

THE island of Hong-Kong, seen from a distance at sea, is, like all the islands on this coast of China, precipitous and uninviting. Its high hills often terminate in sharp peaks, and are thickly strewed with masses of black rock, of primitive formation, frequently piled upon one another in a most remarkable and sometimes fantastic manner, with here and there two or three lower hills, covered with gravel and sand. From the summit to the water's edge there are few or no trees; and, except in the months of May, June, July, and August, when these islands look green, they might be supposed to be quite barren.

On landing and examining the island of Hong-Kong, the N. and N.E. side is found to be separated from the S. and S.W. by one continued range of hills, in no place less than 500, in most parts upwards of 1000, and on more than one pinnacle 1744 feet above the level of the sea, by barometrical observation. When to this is added that the utmost breadth of the island does not exceed 4 or 5 miles, it may easily be imagined that the descent to the sea on either side is very abrupt.

The eastern end of the island is divided from the centre by two deep ravines, both running from the same eminence—the one in a S.E. direction, which terminates in Tie-tam Bay, and the other in a northerly direction, and terminating in the small valley of Wang-nie-chong. The western part of the island is likewise divided from the centre by two ravines, both running from the same eminence—the one to the S. terminating in a small undulating piece of country, on which the village of Pok-foo-lum is situated, and the other to the north, where it spreads out and forms Government Hill and the small flat beneath. Small streams run down all these ravines, and they quickly swell into torrents when rain falls; but, what is remarkable, they never fail to furnish water in the driest season of the year. There are

also other smaller rivulets which furnish a good supply of water at all seasons.

A coarse kind of grass is found on all the hills, but on those with a northerly and north-easterly exposure it is generally choked by ferns and stunted brush-wood; while on the face of the hills fronting the S. it grows in clumps unchecked, except when burnt by the natives.

There are no towns on the island, excepting the flourishing one of Victoria, which was founded by the English in 1841, and formally ceded to the British crown under the Nankin treaty. This town is fast springing into importance, and a 50-foot road runs through it for more than 3 miles to the valley of Wang-nie-chong, where it becomes narrower, and, diverging, crosses over the range of hills by the ravines, already described, to Tie-tam Bay, and from thence to Chek-choo, on the S. side of the island.

The village of Chek-choo is the largest and most important one on the island; and a large detachment of European troops are stationed there. The population of this village amounts to 800, of which 500 are men, about 100 women, and the rest children. There are 180 houses and shops at this place, and the average value of a house is 400 dollars. The people are employed in trading, in farming, and in curing fish. There are about 60 mows* of land under cultivation, which the owners value at 40 dollars a mow of rice-ground, and 15 dollars a mow of land for the cultivation of vegetables. The people of the place cure about 150 pekuls† of fish a-month, for which purpose they use, in the same time, from 30 to 40 pekuls of salt, which they buy at one Spanish dollar for 5 pekuls: 350 boats, large and small, traffic with the place, but not more than 30 are owned by the people there; most of their boats are used for fishing in the vicinity, and the fish, when cured, is exchanged at Canton and other nearer places for the necessities of life.

The houses at Chek-choo are very inferior to those in an ordinary Chinese town on the main land of China, although, on the other hand, some of them are much superior to houses in any of the other villages of Hong-Kong: but the quality of land under cultivation, as well as the quantity, is not equal to that at Heong-Kong, Wang-nie-chong, Soo-kun-poo, and Pok-foo-lum, which are places that may be strictly denominated agricultural villages.

I should estimate the whole land under cultivation on the island at less than 1500 mows; and about two-thirds of that are under rice-cultivation. Allowing, as a liberal price, 45 dollars a

* Sir George Staunton roughly estimates the Chinese mow at 1000 square yards of our measure.

† A pekul is equal to 133½ lbs. of our measure.

mow for the rice-land, and 15 dollars for every other description, the value of the whole land under cultivation may be estimated at 52,500 dollars.*

The other villages on the island, besides Chek-choo, are,—

1st, Heong-Kong, from whence the island derives its name. This village is prettily embowered in trees, and has a good deal of cultivated land about it: its population does not exceed 200.

2nd, Tie-tam is situated at the head of a deep bay, where a good deal of flat land may be reclaimed, and a good boat-harbour formed. A few ships may find protection from the weather in particular parts of the bay of Tie-tam; but, as a whole, this bay is much exposed in both monsoons. The inhabitants of the village do not exceed 50.

3rd and 4th, Wang-nie-chong and Soo-kun-poo. These are both pretty villages, in the midst of fruit-trees, and surrounded by cultivated land. In their vicinity, as at Tie-tam, a considerable extent of land could be reclaimed from the sea, and it shortly will be much required for building purposes. The united population of the two villages amounts to about 350.

5th, Pok-foo-lum is situated about 500 feet above the level of the sea, and commands an extensive view of all the islands to the S. and W. as far as Macao.

There are, besides the villages enumerated, many hamlets on the E. coast of the island, where the magnificent granite of Hong-Kong is principally quarried; and at one of them, called Sai-wan, a detachment of soldiers is stationed.

The place, however, of most prospective importance on the island, with the exception of the town of Victoria, is a village called Shek-pei-wan, which appears to have been once the principal sea-port of the island, and to have been a more flourishing place than it now is. This port, although small, is nearly land-locked; and, having both a western and a southern entrance, it is pretty easy of ingress and egress at all times. An island, of about 2 miles in circumference, called Tap-lee-chow, protects this anchorage on the one side, as the island of Hong-Kong does on the other. There is here abundance of water for a line-of-battle ship to lie at anchor, and its only drawback is in being too small as an anchorage for a large number of European vessels, although 15 or 20 might lie here if necessary. On first visiting this place, in 1841, I was struck with its appearance; and it is probable the time will come when this anchorage will be much in use for repairing vessels, should it not be appropriated by the navy for a dock-yard, for which it certainly seems well-suited. The island of Tap-lee-chow would be a good place for a hospital, work-

* At 4s. 6d. a dollar, 52,500 dollars would equal 11,812*l.* 10s.

shops, patent slips, &c. ; but, in the event of the navy taking it, it would of course require to be fortified.

No public buildings were found on any part of the island of Hong-Kong when it was first occupied by the English, except a small tumble-down Chinese house at Chek-choo, and another at Shek-pie-wan, where the petty mandarins stopped occasionally, and three Chinese temples, one at Chek-choo, one near Soo-kun-poo, and the third and finest at Shek-pie-wan, situated on a little island, not exceeding an acre in extent, and covered with trees. The existence of this last temple, with the ruins of many houses in the same vicinity, gives rise to the impression that Shek-pie-wan has seen better days; and it is known to have been one of the principal resorts of the pirates when they infested this coast of China many years ago; and that it would again lately have been so, had the island of Hong-Kong not been occupied by the English, is more than probable.

According to the Admiralty Chart, Point Albert, Victoria Bay, on the N. coast of the island, is in $22^{\circ} 16' 27''$ N. lat. and $114^{\circ} 40' 48''$ E. long.

The climate is not essentially different from that of Macao; although, of course, particular sheltered localities are more hot, while on the other hand those that are exposed to the monsoons are cooler. Indeed the description of the climate of Macao by the late Dr. Pearson, who was for many years the medical attendant on the Company's establishment there, applies with equal propriety to that of Hong-Kong. The most prevalent diseases are intermittent and remittent fevers, and dysentery: intermittent fever is very common about the equinoxes and in the cold weather; remittent fevers prevail during the hot season, especially; dysentery is common during the whole year, but particularly after sudden changes of weather. The natives appear to suffer from these complaints as well as Europeans, but they have no remedies of their own except counter-irritation, produced by pinching and rubbing with the fingers and with copper cash, in fevers. Vaccination has been introduced by Europeans since the occupation of the island.

The only animals found on the island are a few small deer, a sort of armadillo, and a land-tortoise. There are several sorts of snakes, but no one has yet been found to suffer from their bite.

Among the fruits and vegetables produced on the island are the mango, lichee, longan, orange, pear, rice, sweet potatoes, and yams; a small quantity of flax is grown, and prepared for household uses by the villagers. Since the occupation of the island by the English, the potato of Europe, and the fruits of Canton and Macao, have been introduced; and lately a great many European

seeds have been brought out by the agent of the Horticultural Society of London, and distributed.

Specimens of the zoology and botany of Hong-Kong are being gradually sent home, and a list of these productions will be furnished before long.

The rock of Hong-Kong and of the surrounding islands is granite, in all its stages—that having the quartz, mica, and felspar well mixed, and suited for the best sorts of building purposes, with that wherein these three ingredients vary in proportion, and are not so closely mixed, and consequently only adapted for foundations, dykes, and the other rougher sorts of masonry. Besides granite suitable for building, varieties of this rock are found in places where dykes of quartz intersect it in various directions, and where the quartz preponderates over the other two ingredients. It is also found in the state that the French call “*maladie du granite*.”* The principal soil of the island is decomposed granite, and hills of 200, 300, and even 400 feet high are found entirely composed of it. The felspar, and in some instance the mica, seem to have been affected by some gas which converts it into a sort of clay or pulp, which is either infiltrated along with the rain through the soil thus composed and lodged beneath its surface, or is washed away, leaving the quartz scattered about in grains and fragments, almost in the shape of coarse sand. Where part of the clay or pulp is found still mixed with the soil described, it binds it together well, and makes excellent roads; but where there is a large proportion of clay to the other soils, it cracks in dry weather, and forms into little hard lumps, which is very trying to the horses’ feet, and does not answer well for roads.

In some places close to the sea I have found veins of trap, of a dark slate-colour, varying from 6 inches to 1½ foot in thickness. On the S. and W. sides of the island the rock differs from the generality of that on the opposite side, and assumes the appearance of thick flag-stone, breaking into large crystallized pieces, which it likewise does on the pinnacle of the highest hills, and from time to time falls down and spreads over the foot of the hill. These large stones are very numerous in particular localities, but, owing to their excessive hardness, the Chinese have not yet got into the way of cutting them for use. Occasionally, something like sandstone is found in small pieces, but not of sufficient size to be used for building.

The decomposed granite of which I have spoken is not unfre-

* The state here alluded to is that in which there is a want of coherence of the materials forming the rock, without any visible signs of decomposition. The rock looks fresh, but the slightest blow is sufficient to reduce it to the state of sand, in which all the ingredients are distinct.—Ed.

quently found covered with vegetable mould from 6 inches to 2 feet deep, of a pretty good quality, particularly in the deep ravines, where the ferns and grass have grown, died, and rotted, through distant periods of time. With this exception, there is no other soil, except what has been artificially made, as at those places where rice and other vegetables are cultivated.

The agriculturists of Hong-Kong use the common Chinese wooden plough, drawn by bullocks or buffaloes; and their other agricultural implements are like those used on the main land. Their threshing-floor is made on the first convenient spot outside their farm-house; the ground being smoothed, is afterwards covered with lime, and beaten flat. The grain is sometimes trodden out by cattle, and at others threshed with a flail, quite like our own, except that one piece revolves on a pin with a head, which is fastened into the side of the other. Some of the labouring women wear a hat like the usual Chinese one, but it has a blue nankin curtain, of 5 or 6 inches deep, sewn round the edge of the rim, to keep off the glare from the face.

A small winnowing machine, turned by the hand, on the same principle as our own, is used for clearing the grain of its husk after it has been threshed.

VI.—*On Chinese and European Maps of China.* Addressed by
MR. WILLIAM HUTTMANN to the Council of the Royal Geographical Society.

My attention having been called to a paragraph in your President's last anniversary address, on the desirableness of a new map of China, and your Secretary having recommended me to send to the Society a sketch of the history of Chinese cartography, and a brief notice of the best materials for the compilation of a new map of that empire, I presume now to submit to the consideration of the Council a short account of the principal maps of China and its dependencies that have been compiled either by natives or Europeans, and to suggest what I think would be the best mode of obtaining an improved map of the Chinese empire.

The Chinese have had comparatively good maps of their own country for more than four centuries. The Kwang-yu-too, a large atlas of China, was compiled by Choo Sze Pun, who in 1311 and 1312 visited every part of his native land to render his work correct. This Atlas has been enlarged and improved by various editors, and several editions of it have been published—one of these, dated 1615, was presented to the Royal Asiatic Society by Sir George Thomas Staunton, together with a very large collection of valuable works relating to China, in the Chinese and other lan-

guages, and appears in the catalogue of that Society's Chinese library under the title 'Extensive Maps and Drawings, in four volumes.'

It was from an edition of this work—probably the one above referred to—that the Jesuit missionary, Martini, selected the provincial maps that form his '*Novus Atlas Sinensis*,' printed at Amsterdam about 1655—and although many particulars comprised in the Chinese original are omitted in Martini's Atlas, D'Anville says in his '*Mémoire sur la Chine*,' (pp. 25, 26,) "that the Chinese originals do great honour to China, and prove the superiority of the Chinese, as geographers, over every other Asiatic people."

Although the maps executed by the Chinese before the eighteenth century were better than those of other Asiatic, and even of some European nations, they were not constructed on the scientific principles that are now adopted in surveying and mapping. A new era in Chinese geography commenced, however, in the reign of the Emperor Kang-he, who had his empire surveyed by Jesuit mathematicians, and their map engraved in the Chinese and Manchu languages—China Proper being in the former, and Chinese Tartary, Thibet and Corea, being in the latter language. A copy of this map is in the East India Company's library in London, which also contains a MS. Italian translation of some of the sheets in which the coasts are delineated.

The history of this survey is so fully detailed in Du Halde's '*China*,' and in Mailla's '*Histoire générale de la Chine*' (tome xi. pp. 314-317) as to supersede the necessity for giving it here. This survey is well known to have formed the basis of D'Anville's '*Atlas de la Chine*,' which is, however, by no means a complete and exact translation of the original; but for this that eminent geographer is not responsible, as no doubt is entertained that, except in the general maps, he closely followed the tracings and translations that were sent by the Jesuits from China.

In D'Anville's particular map, which includes the peninsula of Leaou-tung, the part of that peninsula which descends below lat. 40°, and has been called by English geographers, since the date of Lord Macartney's embassy, the Prince Regent's Sword, is omitted, apparently without the editor being conscious of the defect. As the southern part of that peninsula, with the islands in its vicinity, are, however, given in Kang-he's survey, M. Klaproth supplied the deficiency in the map which accompanies his '*Notice sur l'Archipel de Jean Potocki*,' as he named the cluster of islands S.E. of the Prince Regent's Sword. It is a remarkable fact that although M. Klaproth chiefly compiled the generally good map that is appended to Biot's '*Dictionnaire des Villes*

dans l'Empire Chinois,' the name of that archipelago, of which in one sense he was the discoverer, is omitted.

The extension of the western frontier of the province of Szechuen from the river Ya-lung to the Lan-tsang Keang, which is laid down in M. Klaproth's map of the route from Ching-too-foo to Lhassa, that accompanies his '*Description du Thibet*,' is not noticed in M. Biot's map, it having probably not been introduced into it by M. Klaproth, who does not appear to have been acquainted with this accession of territory till after 1828, as he then made the river Ya-lung the Chinese boundary in his '*Carte du Cours Inferieur du Yaron Dsang-bo-tchou*.'

Messrs. Klaproth and Biot have also neglected introducing the addition made to Kan-suh, which now includes Barkhul, Urumtshi, and the surrounding country. This is surprising, as these places are included in a map of Shen-se (Kan-suh not having then been separated from that province), published in the '*Ta-tsing-hwuy-t'een*' (chap. lxiii. p. 3), as early as 1764.

Since the publication of Kang-he's '*Survey*,' great additions have been made to the Chinese empire—the conquest of Calmuck Tartary and Little Bucharia, which was completed in 1759, extended the empire to the Belor Mountains, W. of Cashgar and Yarkand; and the survey of these regions was executed by Fathers Spigahu and Rocha, between 1756 and 1760. I have met with a reference to a new survey of the country between the Great Wall and those mountains, by Fathers Hallerstein, Erpinha, and D'Arrocha, made between 1768 and 1773, but have not seen it. This new survey is, I believe, the basis of M. Klaproth's four-sheet map of Central Asia, published at Paris in 1836.

Spigahu's '*Survey*' furnished the means of correcting the location of towns, &c. in Sungaria and Eastern Turkestan, which were very inaccurately placed in Kang-he's map. The position of Hami (Khamil), and even of Thurfan, are given with tolerable correctness in that map, as they had for some time formed part of the Chinese territories; but W. of these places the longitudes from Peking are much too low. For instance, Yarkand, in Kang-he's '*Survey*,' is placed $32^{\circ} 40'$; while its longitude, observed about 1759, is $40^{\circ} 10'$; and Cashgar, which is placed in $34^{\circ} 10'$, is really $42^{\circ} 25'$ W. of Peking. E-le, the former capital of the Eluths, is not given in Kang-he's map, although the river on which it stands is properly placed. Its Chinese name is Hwuy-yuen-ching; it is the present capital of Sungaria and Little Bucharia, and the well-known place of exile for Chinese criminals. Its position is N. lat. $43^{\circ} 56'$, long. W. from Peking $34^{\circ} 10'$.

Spigahu and Rocha's '*Survey of Calmuck Tartary and Eastern Turkestan*' is included in a new edition of Kang-he's map that was engraved by order of the Emperor Keen-lung about 1761,

in ten very long rolls, comprising above 100 sheets. A copy of this splendid but incorrect work, which for brevity I will call 'Këen-lung's Map,' was presented in 1825 to the East India Company's library in London by Mr. John Reeves, then of their establishment at Canton. This map includes not only the Chinese empire but also the whole of Northern Asia; but much better maps of Asiatic Russia have been published at St. Petersburg. The names in China Proper are in Chinese, and in the other parts of the map in Manchu. I have translated for the Hon. East India Company the whole of the Manchu, and a considerable part of the Chinese division of this map, which is much more extensive and detailed, but less correct, than Kang-he's. The principal faults in it are the boundaries between the Russian and Chinese empires not being marked with sufficient clearness; the names of places in China Proper, which are thrice as numerous as in Kang-he's map, being in very small characters, and in many instances much crowded; and, what is of much more importance, as it greatly diminishes its value as an authority, the longitudes, particularly at some distance from Peking, being generally too high, although in Manchuria they are frequently too low.

The meridian lines in Kang-he's map are curved, and in Këen-lung's strait, which might cause erroneous placement in parts where no observations were made; but as the differences in longitude between these maps do not increase or diminish regularly in proportion to their distance from Peking, the first meridian, this does not show the cause of the errors in Këen-lung's map, especially when it differs from the observations taken by the Jesuit mathematicians.

The longitudes of Yarkand and Cashgar were, as has been already remarked, settled about 1759—the former being $40^{\circ} 10'$, the latter $42^{\circ} 25'$; but in Këen-lung's map the former is $41^{\circ} 15'$, the latter $43^{\circ} 25'$. In Këen-lung's map the most westerly part of Yun-nan is $24^{\circ} 20'$, while in Kang-he's it is only $19^{\circ} 5' W.$ of Peking; and Ching-too-foo, the capital of Sze-chuen, is placed 2° too far W. by Këen-lung; Ching-shan-wei, near the eastern point of Shan-tung, is placed in Këen-lung's map $7^{\circ} 40' E.$ of Peking, but its true situation is $6^{\circ} 30'$.

While these longitudes are all too high, those in Eastern Tartary are too low. Ning Ku tha, which is placed in Këen-lung's map $12^{\circ} 10' E.$ of Peking, was found by Kang-he's surveyors to be $13^{\circ} 15'$; and Tonton Kashan, which was apparently the most easterly point they settled by observation, is $19^{\circ} 58'$, yet in Këen-lung's map it is only $16^{\circ} 25' E.$ of Peking.

Kang-he's and Këen-lung's maps being frequently referred to in this paper, it seems desirable that their respective scales should

be mentioned, and as D'Anville's '*Atlas de la Chine*' is generally known, it may be stated, that Kang-he allows about one-third more, and K'een-lung about one-fourth more space to a degree of latitude and longitude than D'Anville.

I have a notice of a new map of China Proper, finished in 1782, by Fathers Hallerstein, Erpinha, and Andrada. In this map, which I have not seen, China, including Shing-King, or Mukden, is divided into 19 provinces, and subdivided into 496 districts. This map was probably published to include the survey of Sze-chuen, &c., made by order of the General A-Kwei, after the conquest of Kin-chuen and the Meaou-tsze in 1775, as before that date the western parts of Sze-chuen and Yun-nan, and many districts in Kwei-chow, Kwang-se, &c., were scarcely accessible to the Chinese.

It is not unlikely that the map of 1782 is referred to as being in preparation, in a letter dated Peking, July 27, 1775, printed in the '*Mémoires concernant les Chinois*,' tom. ii. p. 417:— "The reigning emperor (K'een-lung), to remedy the defects of the ancient charts (Kang-he's), which were on too small a scale to admit of the introduction of all the towns, had them extended to 100 large sheets (probably K'een-lung's map); but when they were printed he found the names so crowded, and so many garrisoned towns omitted, that he immediately ordered them to be re-engraved on a larger scale."

The subjugation of the Meaou-tsze, in 1775, extended the province of Sze-chuen above 2° in a westerly direction. Prior to that conquest, the Ya-lung-Keang, about 15° 30', formed the boundary of Sze-chuen on the eastern frontier of Thibet, which is now formed by the river Lan-tsang, above 18° W. of Peking. The old boundary is, however, still retained in the most modern European maps of China—even those compiled by good Chinese scholars, such as the Rev. C. Gutzlaff's, prefixed to his '*China Opened*,' and the larger, but less beautiful map that accompanies his '*Sketch of Chinese History*.'

There is also, in the library of the East India Company, in Leadenhall Street, an atlas of China Proper, divided into 17 provinces (Keang-nan forming only one instead of two, as it should have done), printed in the tenth year of Kea-King's reign (1805). I have referred to this atlas in an article '*On Countries favourable to the Growth of Tea*,' inserted in the '*Asiatic Journal*' for December, 1822, in which I suggested its cultivation at Serinaghur in British India; but as it is superseded by more recent and more complete atlases of the Chinese empire, I shall only remark here, that, although useful in some respects, it is disfigured by the adoption of the vulgar or abridged forms of the Chinese character.

Within the last twenty years, two or three new maps or atlases of the Chinese empire have been published by natives of China, based on the surveys of the missionaries, and correctly graduated. One of these, according to the 'Chinese Repository' (vol. ix. p. 64), was published, in 1832, by Li-yang-hu, on a broad-sheet, 11 feet by 8, with the lines of latitude and longitude. The editors of the 'Repository' add, "It is the best native work we have seen, being, in some respects, superior to the MS. one of Li-tsing-che." A copy of this map having been sent to the Royal Library at Paris, in 1843, M. Biot has described it, in the 'Journal Asiatique' (4^{me} serie, tom. i. p. 279), as being a reprint of the Jesuit missionaries' maps, with the addition of the country formerly occupied by the Meaou-tsze, and the correction of the names and extent of the districts in China which had been changed since the reign of Kang-he. I am not aware of a copy of this map being in England, although one could easily be procured from Hong-Kong; but Mr. Plowden, formerly president of the Select Committee at Canton, and now one of the directors of the East India Company, brought from China a valuable map of that empire, in the Chinese language, compiled by Le-ming-che, who was well acquainted with the European principles of geography. As this map, which was published about 1825, contains much information that would be useful in the compilation of a new map of China, and Mr. Plowden obligingly allows it to be submitted to the Society for inspection this evening, some notice of it may perhaps be interesting. This atlas comprises one general and forty special maps, with six folio pages of introduction, containing a geographical epitome of China and its dependencies. It is entitled 'Ta-tsing wan nêen yih tung king wei yu too,' i. e. 'A General Map of the Ta-tsing (Chinese) Empire.' The maps vary in size according to the number of degrees of latitude and longitude comprised in each province or district—about one inch being appropriated to each degree of longitude, and about an inch and a quarter to each degree of latitude. A separate map is given of each of the eighteen provinces into which China is now partitioned, instead of the fifteen that existed when Kang-he's survey was made—Keang-nan having subsequently been divided into Keang-Soo and Gan-hway, Hoo-Kwang into Hoo-pih and Hoo-nan, and Shen-se into Shen-se (sometimes called Se-gan) and Kan-suh. A supplementary map of this last province is given, containing the desolate tract extending from the Kea-yu gate in the great wall to beyond the 28th degree of longitude W. of Peking, which was added to Kan-suh in the early part of Kêen-lung's reign. This supplement includes part of the great sandy desert called Sha-mo, or Han-hae, by the Chinese, and Cobi by the Manchus and Mongols; and the districts formerly

called Barkhul and Urumthsi, but now named, by the Chinese, Chin-se-foo and Te-hwa-foo.

The province of Shing-King, of which Mukden, or Fung-tëen-foo, is the capital, has a special map; and the country bordering the river Hih-lung (called Sahalian by the Manchus, and Amur by the Russians) has four: two for the district of Kirin, or Ning-Kut ha, on the coast, and two for Hih-lungkeang, or Tshitsikar, in the interior.

The province of E-le, comprising Sungaria and Eastern Turkestan, has also four special maps: one for the district of Hwey-yuen-ching (E-le), one for the country round Hami and Thurfan, one containing Kutchay and Aksu, and one including Ho-thean, Cashgar, and Yarkand.

Two maps are devoted to Inner and four to Outer Mongolia; one each to the districts of Khopto, Tsing-hae, Han-hae, Tchabar, and Uliasutae, and two to Thibet; but as these merely carry the Thibetian rivers to the southern frontier of that country, they do not assist in settling the question whether the San-poo, or great river of Thibet, joins the Brahma-putra or the Irawati. I however confidently expect that when the country between British India and the province of Yun-nan is explored by European geographers, the San-poo will be found to form the principal branch of the Irawati instead of being the main feeder of the Brahma-putra. This problem, which is of importance not only as connected with the establishment of an interesting geographical fact, but also as bearing upon the question whether communication could not be maintained between Bengal and China by means of rivers, instead of by the Strait of Malacca, particularly at the shifting of the monsoons, seems to be worthy of investigation by the British or British-Indian Government.

Corea is not included in the map under description, but is given in both Kang-he's and Këen-lung's maps, with the names in Manchu letters, and in the map of 1832, with the names in Chinese characters. If it should be considered desirable to publish a map of Corea as part of a new Chinese atlas, the names of the towns, &c., could be given from Corean authorities, according to the Corean pronunciation; and the positions of the islands, and the outline of the coast, could be corrected from European navigators, on whose authority that kingdom might be reduced in size, if it has really been extended 2° too far S. in the Chinese maps.

A slight inspection of this collection of maps will show that the undue space allotted to mountains and rivers, the imperfect mode of laying down the coasts and islands, and the want of care in locating cities, &c., in their true positions, would prevent its being adopted as the groundwork of a new map of China. For this, Kang-he's map, with the subsequent surveys, should be adopted.

Le-ming-che's map would, however, be of very great value in furnishing the present names and rank of the Chinese cities, and the boundaries of the existing provinces, with their division into foo or counties. In addition to this, it gives the names of many towns belonging to the aborigines, or foreign colonists, in Kansuh, Sze-chuen, Yun-nan, Kwei-chow, Kwang-se, &c., and the locations of the Calmuck, Mongolian, and Manchu banners or tribes in Tartary, which are not generally included in Këen-lung's map. It is also the only work I am acquainted with that gives the towns, &c., in the tract of country formerly called Sefan and Tufan, lying between the Ya-lung and Lan-tsang rivers, which has been incorporated with China since the publication of Këen-lung's map.

Although Le-ming-che's atlas furnishes so much valuable information, its giving the names of places in Manchuria, Mongolia, Sungaria, Eastern Turkestan, and Thibet in Chinese characters, which are singularly ill adapted to the expression of foreign names, renders its orthography unsuitable, except for China Proper. Russia he calls O-lo-sze; the Thurguths, Too-urh-hoo-ti-r; the Ortus, Ohuh-to-sze; the Buriats, Poo-loo-tih; and the Kirghiz, Kih-urb-kih. He also calls Sairim, Sa-le-muh; and Ushakthal, U-sha-kib-tha-lib.

The language of Thibet abounding in double consonants, both as initials and finals, while the Chinese language admits no double consonants as initial sounds, and only *ng* and *n* as consonantal finals, it may readily be imagined that Thibetian names expressed by Chinese characters can scarcely be recognized. Këen-lung's map giving them in Manchu letters has rendered their identification considerably easier; but some peculiarities in the orthographical system of the Manchu language prevents its expressing Thibetian names with precision.

As giving places in our maps the names by which they are known to the natives is of great importance, it is a fortunate circumstance for geography that the Emperor Këen-lung had an hexaglott geographical dictionary of Sungaria, Eastern Turkestan, and Thibet printed in 1763. This work, which merits translation, is entitled 'Se-yu-tung-wän-che,' and is in the Chinese, Manchu, Mongol, Calmuck, Thibetian, and Turkestani languages and characters. It would enable any person who can merely read these characters to settle accurately the native names of places in these three countries, of which we have scarcely any recent accounts, except that furnished by Mir Izzet Ullah, which has been translated by Professor Wilson, Director of the Royal Asiatic Society, and elucidated by his profound and varied knowledge.—(See 'Journal of the Royal Asiatic Society,' vol. vii. art. xxxi.)

In relation to the materials within our reach for the construction

of a new map of the Chinese empire, the preceding remarks prove that neither Këen-lung's nor Le-ming-che's maps can be taken as the basis; but that the survey made by the Jesuit mathematicians in the reign of Kang-he must be adopted; adding to it the surveys subsequently made in Sungaria, Eastern Turkestan, and the western provinces of China. Upon these should be engrafted the valuable surveys of the Chinese coasts made a few years since by the East India Company, and more recently by the Admiralty, all the information that is worth extracting from Le-ming-che and other modern Chinese geographers, and such materials of undoubted authority as may be gleaned from publications like Klaproth's maps of the route travelled by a Chinese officer, between 1786 and 1790, from Ching-too-foo to Lhasa, and of the course of the Yarou-dsang-bo-chou; and Timkowski's map of the route from Kiakhta to Peking, which is not laid down in either Kang-he's or Këen-lung's map.

As I have mentioned Kang-he's survey as the best foundation for a new map of the Chinese empire, it is necessary to establish its claim to be adopted as a guide in delineating the general features of the country, and for placing the towns, &c.

The Jesuit mathematicians who were employed in conducting that survey were undoubtedly well qualified for their task, and had every needful facility afforded them by the Chinese government; and the general correctness of their observations may be inferred from their very nearly agreeing with those that late occurrences have enabled Englishmen to make. I have compared the latitudes and longitudes of several places as given from recent observations in Mr. Walker's chart of the coast of China from the Canton river to the Yang-tze-keang with those given in Kang-he's map, and find the difference never to exceed a few minutes, which difference may be accounted for by the improvements made since Kang-he's reign both in instruments and processes of observation.

If it should be remarked that it would be injudicious to adopt as the foundation of a new map of China a survey that is confessedly wrong sometimes several minutes in the location of places, I should coincide with that remark if there was the slightest probability of our obtaining a more correct general basis; but this is quite hopeless. The Emperor of China is not at all likely to have his empire re-surveyed; and the idea that he would allow any European government to send a corps of geographers to survey it for him, if even the English or French should be willing to incur the enormous expense such an undertaking would occasion, is too preposterous to be seriously entertained for a single moment. We have then no alternative but adopting Kang-he's survey as the basis of a new map, or allowing our

maps of China to remain in their present state of great incompleteness and inaccuracy.

Happily we possess the means of improving Kang-he's map by adding the information furnished by Spigahu, A-kwei, and recent Chinese geographers, and of correcting some of its errors from the English surveys of the coasts, and from a table of latitudes and longitudes of many places in the empire that was published in 1818 in the *Ta-tsing-hwey-tëen*, and which sometimes differ a few minutes from Kang-he's positions. This table, besides giving the situations of the provincial capitals, furnishes the latitudes and longitudes of about 120 places in Manchuria, Mongolia, Sungaria, Eastern Turkestan, and Thibet, and of 17 in Kin-chuen, that formerly belonged to the *Meaou-tsze*. If 50 of these are added, as new observations, to the 620 places whose positions were fixed by Kang-he's surveyors, and the 43 by Spigahu are included in the account, there will be a total of more than 700 points fixed by observation in the Chinese empire, forming a much better foundation for a new map than exists for any Asiatic country except British India.

Of the general correctness of the survey by the Missionaries, Mr. Davis, who visited Peking in 1816, and has lately left England to assume the government of Hong Kong, speaks in the following laudatory terms:—'In the Chinese Library of the East India Company at Canton is a MS. map chiefly compiled from the labours of the missionaries, and its extreme accuracy can be vouched for with respect to those parts of the empire through which Lord Amherst's embassy passed.'—('Trans. of the Royal Asiatic Society,' vol. ii. p. 90.)—The same gentleman also, in communicating to the Royal Asiatic Society the translation of a Peking Gazette relating to the war of 1826 in Western Tartary, accompanied by a fac-simile and translation of a Chinese map of its seat, adds the following note:—'Cashgar is very correctly laid down in the MS. map of Chinese Tartary made by the Missionaries. This MS. map corresponds in a surprising manner, both in respect to latitudes and longitudes and the names of places, with our own maps.'

The statements in this paper show the imperfection of even the newest and best maps of the Chinese empire published in European languages, and that abundance of excellent materials for the construction of a new and comparatively perfect map of the Chinese dominions exist either in England or in China, whence they could easily be obtained. The only point that remains unsettled is who should defray the expense of compiling and engraving such a map or atlas.

Had the connection of the East India Company with China continued, there is scarcely any doubt that, with their accustomed

liberality, they would have defrayed the expense; and even now, although that connection has been dissolved, it is not at all improbable that they would afford pecuniary assistance in the execution of such a work, especially as their territories approximate to the Chinese empire both on the north and east.

Although her Majesty's Government does not usually aid such undertakings, yet the great political and mercantile interest this nation has in China may perhaps induce the ministry to afford assistance in the publication of so useful an auxiliary to our commerce as a good map of China. Many individuals also, who are desirous of promoting geographical knowledge, would be likely to contribute funds towards the publication of such a work if it should be undertaken by your Society. Neither should this fact be overlooked, that it is almost certain that the proceeds of the sale in Europe, America, and China would ultimately repay a considerable proportion, if not even the whole, of the outlay.

VII.—*On the Isthmus between the Lake of Granada and the Pacific; being an Extract from a "Memoir on the Lake of Granada, the River San Juan, and the Isthmus between the Lake and the Pacific Ocean, in the State of Nicaragua, Central America."* By MR. J. BAILY, Lieutenant of Marines, H.P.

[In the years 1837-38, the Lake of Granada (sometimes called of Nicaragua), the River San Juan, flowing out of it to the Atlantic at the port called San Juan del Norte, in lat. $10^{\circ} 56' 45''$ N., and long. $83^{\circ} 43' 14''$ W. of Greenwich, and the isthmus lying between the lake and the port, called San Juan del Sur, on the Pacific, in lat. $11^{\circ} 15' 37''$ N., and long. $85^{\circ} 52' 56''$ W., were surveyed by Mr. Baily, at the request and under the authority of General Morazan, then President of the Central American Republic, for the purpose of ascertaining the practicability of forming a communication for shipping between the Atlantic and Pacific Oceans. The results of this survey Mr. Baily has kindly communicated to the Society; but previous to the arrival of his memoir, the 'Nautical Magazine' for 1840-41 had published a very valuable account of an 'Excursion to the Lake of Nicaragua, up the San Juan,' by Mr. George Lawrance, assistant-surveyor of H.M.S. Thunder, Commander E. Barnett; and as the two accounts are, in many parts, exactly similar,* we are under the necessity, in order to avoid repetitions, of confining ourselves to a selection, from Mr. Baily's paper, of that portion only which may be regarded as supplementary to Mr. Lawrance's—namely, that which describes the country between the Lake of Nicaragua and the Pacific, which Mr. Lawrance merely passed over.—ED.]

THE Port of San Juan del Sur on the Pacific, in lat. $11^{\circ} 15' 37''$ N., long. $85^{\circ} 52' 56''$ W., is small but sufficiently commodious

* Mr. Lawrance acknowledges himself greatly indebted to Mr. Baily for much of his information.

within, surrounded by high land, except from S.S.W. to W. by S., where it lays open to the ocean; the depth of water, about 300 yards from the beach, is 3 fathoms, increasing gradually to 6, 7, 8, and 9 fathoms; the entrance is 1100 yards across, the anchorage good, on a mud bottom generally. The prevailing winds on this part of the coast are north and north-easterly, blowing sometimes with great strength; and when such is the case, vessels may occasionally encounter some difficulty in making the port. Fresh water can be obtained at a short distance from the beach; fish is abundant, but nothing else except fire-wood is to be had, the neighbouring lands being at present in a state of nature, without inhabitants or habitations, nor is there either village or town nearer than that of Nicaragua, at a distance of 7 or 8 leagues: intermediately, however, there is some cattle.

From this port, a line of levels has been run, not in a direct course, but diverging as the face of the country required for passing the range of heights at its lowest point, a brief description of which is as follows:—From the beach to the distance of 5880 yards the ground rises, with a gradual acclivity, to the height of 284 feet; then, for 904 yards, there is a much greater proportional rise, until, at 6784 yards, it attains the summit-level, which is 615 feet above the level of the ocean; this ridge is the *divortia aquarum*, the streams on its western side falling into the Pacific, and those on the eastern finding a course to the Atlantic through the Lake of Granada and River San Juan. From the summit-level the descent is rapid; for, at the distance of 8664 yards, the elevation is again reduced to 295 feet, whence there is a gentle declivity, with slight alternations of rise and fall, down to the margin of the lake, at the mouth of the river Laxas; the whole distance from sea to lake, through all the sinuosities of the line, is 28,408 yards; at 21,616 yards the line cuts the river Laxas, which thence runs 6792 yards, and discharges into the lake; the direct course from the sea-beach to the mouth of the river is N. 33° 30' E., and the direct distance 20,401 yards; the embouchure of the river is in lat. 11° 24' 7" N., and long. 85° 46' 39" W. In directing the course of the levels, the lowest grounds were chosen, when this could be done without deviating widely from an approximate straight line; in many parts it passed through ravines, the sides of which are elevated from 30 and 40 to 100 or 120 feet, and in a few instances rather more; these, during the rainy season, are water-courses, and in some there are permanent streams.

In this tract of country the land, in the vicinity of the range of heights, is thickly wooded with timber of various descriptions, much of it of fine size and excellent quality; limestone abounds; the soil in general is of a most fertile character, but there is no cultivation, that part of it belonging to individual proprietors

being occupied for grazing; and in one or two places there are estates of this description, but these are neither well attended to nor of much importance: there is no village or hamlet, the whole district remaining in a state of nature, although well suited to agriculture, and capable of almost every species of improvement; the climate is good and salubrious; the temperature moderate, as the heat seldom exceeds 84 or 86 degrees of Fahrenheit. The river Lajas varies from 25 to 100 yards in breadth, with depth of water from 1 to 3 fathoms; the bottom is of mud to a further depth of several feet, beneath which there is, in some places, rock or stone; this was ascertained by repeated borings; the bank on one side is thickly wooded for a distance inland of about 300 or 400 yards; on the opposite side there is a dense growth of wild cane of greater extent. The result of these levels, which were run with great care and attention by a good theodolite during a period of four months, makes the surface of the Lake of Nicaragua 128 feet 3 inches higher than the Pacific at low-water mark on the day of full moon, when the rise of tide in Port San Juan is 12 feet: the lake of Managua is 28 feet 8 inches higher than that of Nicaragua.

By observations, made in October, 1838, at the ruined fort near Granada, in calm weather, when the rainy season had just terminated, and again in May, 1839, before the rains had commenced, when the lake was at the lowest, the difference of height between these extremes was found to be 6 feet 6 inches. A similar observation, made at the same place in Nov. 1839, gave a result of 14 inches less than that of the preceding year for the greatest height the water had obtained; but the rains of the latter season had been notoriously less copious than in the former. As these observations include the space of an entire year, they may be taken as including also the effect produced by evaporation, which, according to various calculations, amounts upon an average to about 39 inches per annum in intertropical climates.

This brief account elucidates what, when Humboldt wrote, he thought much to be desired, viz., the true nature of the range lying between the Pacific and the Lake of Nicaragua: it confirms his supposition that it is rather a hilly tract than a continuous cordillera.—Ed.

VIII.—*On the Town of Carmen and the Rio Negro.* By Mr. MURRELL R. ROBINSON.* Communicated by Lord STANLEY.

THE town of Carmen is in $40^{\circ} 36'$ S. lat. and $63^{\circ} 18'$ W. long., and is situated on the N. bank of the Rio Negro, 16 miles from the mouth of that river, which discharges itself into the South Atlantic Ocean in $41^{\circ} 4'$ S. lat., and $62^{\circ} 50'$ W. long.

The settlement was formed by Francisco Viedma, an officer in the service of old Spain, in the year 1779, not so much with the view of founding a colony as to establish a military post for the protection of the Spanish settlements on the western coast of South America, it being supposed (the River Negro being then unexplored) that a hostile naval force might proceed up the river into the interior of the Spanish territories.

This supposition, when the river was explored by Basilio Valdivia in 1782, was found to be erroneous, for although he proceeded to within 60 miles of Valdivia, on the opposite coast, yet the shallowness of the water and numerous other difficulties would militate against a hostile invasion proceeding by that means. Upon the declaration of independence of the South American provinces, the settlement on the Rio Negro remained under the government of the Buenos Ayresian Republic.

The town and settlement contain at present a population of about 1230 persons, who may be divided into the following classes:—

	No.
Spaniards, including men, women, and children . . .	800
Africans . . ditto . . ditto . . ditto . .	280
Indians (slaves) . . ditto . . ditto . . ditto . .	150
<hr/>	
Total	1230

This number includes the soldiers, of whom there are about 120, principally Africans. These men are commanded by a major in the Buenos Ayresian service, who is also commandant of the settlement, and is the highest authority in the place. All former officers in this capacity had the power of life and death conferred upon them by the government, but it appears to have been abused and has not been granted to the present commandant.

The officer next in authority is a justice of peace, who adjudicates on all civil misdemeanours in the settlement. He has two civil officers of an inferior degree to assist him; these, with an

* The present paper is the substance of a Report drawn up at the Falkland Islands, from notes made at Carmen, to which place Mr. Robinson had been sent by the governor of the Falklands.—[Ed.]

officer of customs and excise, constitute the whole of the official authorities in the place.

All these officers keep small stores, and no one is able to read or write but the justice of the peace, whose knowledge of the latter art consists in little more than his signature.

The town or village, which is very irregularly and badly built, stands on the side of a steep sandstone bank, rising above the river to the height of fifty feet; its most prominent object is a ruinous mud fort, erected by Viedma at the formation of the settlement. There are seven pieces of ordnance mounted upon it which are occasionally discharged, to the great peril of the fort and gunners. The houses are of one story, and of mud bricks; some few are lime-washed; only the most wealthy persons have glass in their window-frames. The principal street, if it can be called by such a name, runs along a slight ridge on the bank before mentioned; it is about 500 yards in length and 18 in width, and is almost impassable for any description of carriage, owing to the depth of the sand; the inhabitants, however, experience little inconvenience from this circumstance, as they are always on horse-back; there are but three wheel-conveyances in the place, and these the clumsy bullock-carts of the country.

The total number of houses and huts in the town may amount to 100 on the north and 30 on the south bank of the river.

There are also about a dozen farm-houses on either side of the Rio Negro, between its mouth and the town; but of all these dwellings in the town and its vicinity, not more than two-thirds are inhabited.

Soon after the construction of the fort by Viedma, several good stone and brick houses were built on the east side of it by order of the King of Spain, at an immense expense. These houses have not been inhabited for years, and now, though in good repair (at least all the important parts), are almost buried in sand, the roofs of many are alone visible. Probably their great exposure to the clouds of sand continually driven over exposed situations, was the cause of their being abandoned. The drifting sand has also filled up a well which was sunk at a considerable expense, by the Spanish government, in the centre of the square.

Among the cultivated products of the settlement at the Rio Negro, wheat is the chief article by which the inhabitants derive their subsistence. It fetches a very high price at Buenos Ayres, to which town the whole growth is annually sent. At the Rio Negro its value varies from 25*s.* to 3*l.* the fanega, a Spanish measure containing rather more than three English bushels. Occasionally it fetches even a higher sum than this. Flour when I left was selling at 5*d.* per pound, but this was an extraordinary

case, owing to the war between Buenos Ayres and Monte Video. I am informed that the cause of the wheat fetching this price does not arise from any great expense attending its cultivation, but because none but that grown in the province is allowed to be imported at Buenos Ayres; and at present very little wheat is produced in the country. The average quantity of wheat grown annually at the Rio Negro may amount to 10,800 bushels; of these 7000 bushels are sent to Buenos Ayres.

Barley is grown, but not so largely; it also fetches a high price, varying from 1*l*. to 28*s*. the fanega. It is principally consumed in the settlement as food for the horses. These are the only two kinds of grain grown in sufficient quantity to be worthy of notice. The quality of both is tolerably good.

Indian corn is grown in small quantities, but it is generally used as a vegetable when green, its arrival at maturity being uncertain in this climate, owing to the frequency of frosts in autumn.

The following fruits are cultivated, and in favourable seasons (I mean when any rain falls) arrive at great perfection:—Peaches, nectarines, quinces, apples, pears, walnuts, figs, and grapes: the latter seem to succeed better than any other fruit grown in the place, and are in profusion. Some little wine is made from them for home use: what I tasted seemed to be inferior to the worst description of common English cider, and somewhat similar in flavour. I saw one olive and one orange tree; and though the trees were strong, and the fruit upon them of its usual size, yet they never ripened, owing, I was informed, to the frequency of sharp frosts at night towards the end of summer.

Melons, pumpkins, vegetable-marrow, &c., are grown in great abundance; and when there is any rain, as is the case with everything connected with agriculture, succeed well.

Some hides and tallow are exported, but not in sufficient quantity to create a trade of any importance.

Many skins of guanaco, lion, nutria, skunk, ostrich feathers, and Patagonian and other mantles, made of the skins of animals peculiar to that part of South America, are exported. The inhabitants receive good remunerating prices for these objects from masters of small vessels which occasionally visit the Rio Negro for wheat or salt for the River Plate.

Beef is occasionally exported to the Brazils; but it does not generally find a good market, as beef salted at Carmen, except during the months of June and July, does not always keep well, and the salt of the country is not particularly well adapted for curing beef. The inhabitants jerk beef, but for home consumption only.

Formerly, and indeed till within the last three years, much

salt was exported from the Rio Negro, but the trade has greatly fallen off since that period; the salt having been found to be neither so good nor so cheap as that procured from Spain and the Cape Verd Islands. The salt exported from the Rio Negro is of two descriptions. It is collected from 'Salinas,' at various distances inland; the principal 'Salina,' or salt-lake, being twenty-four miles to the north of Carmen, and others at greater and less distances.

The repositories of the salt are natural: they are large shallow places, in which the rain-water collects and dissolves the salt with which the soil is impregnated. This water, from the warmth and dryness of the climate, soon evaporates, and leaves the salt on the surface of the ground, to the depth of nine or ten inches, from whence it is cleared away as required; after more rain has fallen fresh salt appears. The earth in many parts of the country is strongly impregnated with saltpetre.

The two most important articles, however, to future settlers in the Falkland Islands are horses and sheep. Of the former, those at the Rio Negro are fine animals, and, I believe, are considered generally to be of a superior description to any in that part of South America; indeed both mares and stallions are frequently sent to Buenos Ayres and Monte Video, for the purpose of improving the breed in those towns.

Upon the first settlement, in 1779, great pains were taken to establish a good breed of horses. Stallions of a superior description were sent there by the King of Spain for that purpose.

Both horses and mares are exceedingly plentiful, and comparatively cheap. Good horses, well broken in, and trained for the 'lasso,' may be purchased at from six to ten Spanish dollars each by inhabitants of the place; but foreigners, known to come here for the express purpose of purchasing horses, will not obtain good ones for less than from ten to thirteen dollars, equal to 2*l.* 3*s.* 4*d.*, and 2*l.* 16*s.* 4*d.* Common horses, and good breeding mares, may be purchased at from 1*l.* 5*s.* to 2*l.* each. The mares are of little value to the owners; they are never ridden, and (excepting breeding) are used only for treading out corn. They are, however, extensively bartered with the Indians for ponchos, horse-rugs, &c., of Indian manufacture, and skins of the wild animals of the country. The Indians consume numbers of them for food, their flesh being much preferred to that of bullocks.

To persons purchasing large numbers of horses from the Rio Negro, it may be important to know that the depth of the river in many places will allow vessels to lay alongside the banks without danger; and that any quantity of grass for horses on the voyage can be cut close to the river, with no greater expense attached to it than the labour. It is my humble opinion that good horses may

be landed in the Falkland Islands, from the Rio Negro, if bought in large numbers, at from 10*l.* to 12*l.* each. Judging from the horses procured from Buenos Ayres and Monte Video, which I have seen in this colony,* and those I purchased for the service of this Government at the Rio Negro, it appears to me that those obtained from the latter place are much superior, while they are also cheaper.

It is probable that the Rio Negro, and Bahia Blanco, a settlement of a similar description to Carmen, about 120 miles to the N., are the best places for settlers at the Falklands to procure horses and sheep, not only because the animals are of a superior breed, but because the climate approaches somewhat nearer to that of these islands, and the change, if they were landed in spring, would be less felt. The length of passage is also one half that from Buenos Ayres or Monte Video.

Sheep are bred in large quantities in the settlement of the Rio Negro, and are generally cheap, averaging two shillings each. They also appear to be a finer animal than that which has been brought to this colony from towns in the River Plate. I think that sheep can be brought from the former place to the Falkland Islands for 1½ to 2½ dollars each, but not by regular trading vessels until there is a return cargo, but by some of the numerous sealing vessels and tenders to whalers which occasionally go there from the South for refreshment, and touch when going to their whaling or sealing grounds, which is generally in the neighbourhood of these islands, or on the adjoining continent, and consequently would be glad to obtain such a cargo, which would cost them a mere trifle there, one sheep being purchased at from 6 to 9 paper dollars† each, equal to 1*s.* 7½*d.* and 2*s.* 6*d.*; and from the shortness of the passage, which averages seven days, little risk of losing any would be incurred.

The size of the vessels that go to the Rio Negro would not allow them to carry more than from three to four hundred, but the amount arising from the sale of that number of sheep would amply remunerate the master of a vessel of that size. I do not think a merchant-vessel could afford to bring sheep from that place to Berkley Sound, if she has no other trade in view, under 3½ dollars each, equal to 15*s.* 2*d.*

It may appear strange that with so many sheep (in a country like the Rio Negro) there should be no wool exported. The only reason that I can assign for it is the indolence of the inhabit-

* The Falklands.

† The value of the paper currency varies considerably: when I was at the Rio Negro, 16 paper dollars were equal to 1 patacon, or Spanish dollar; but in times of distress of the Buenos Ayresian Republic they have been at a much greater discount, 31 paper dollars having only been equal to 1 Spanish dollar.

ants. The wool of the Rio Negro is certainly not good, though it might be improved by clipping, which is seldom practised, and by careful washing.

In the time of the war between the Brazils and Buenos Ayres much salted pork was exported from Carmen for the use of the shipping, but latterly all trade in that article has fallen off. There are many pigs in a semi-wild state in the country, but they are considered of no value.

The climate of Rio Negro is remarkably healthy. From the short time I was there I had no means of forming a true opinion of the temperature, but from inquiry I ascertained that the thermometer rises as high as 95° Fahrenheit in summer, and that it is frequently below freezing point during the months of April, May, June, and July; that ice is frequently formed during those months, but usually disappears before mid-day. Winds are almost continual, and very changeable, generally blowing from all points of the compass during the twenty-four hours. They are usually fresh, and come in strong and sudden gusts. I think I am not wrong in stating that it is decidedly more windy than at the Falkland Islands. Whirlwinds of much force are common. The nights and early mornings are frequently, as at these islands, beautiful and calm. The wind usually rises at about 10 A.M. and continues till 4 P.M. The great evil of the climate is the scarcity of rain: occasionally none falls, or perhaps only a trifling quantity, for two and even three years, and it seldom happens that more than one or two heavy showers fall during the year. Slight showers of snow fall occasionally during the winter, but seldom remain on the ground beyond an hour. Thunder and lightning are frequent, but generally harmless. "Pamperoes" occur frequently, but have not the force of those on the River Plate and in its immediate neighbourhood. Heavy dews are not uncommon; they generally proceed from a northerly wind.

The mouth of the Rio Negro is situated in 41° 4' S. lat. and 62° 50' W. long. This river is supposed to rise at the foot of the Andes, whence it runs generally in an easterly direction towards the sea; its width at the mouth is about 2 miles, but it rapidly narrows, and at the town of Carmen, only 16 miles from its embouchure, it is about 280 or 300 yards. It does not decrease much in width above the town for the next 20 miles; but it is entirely unfit for navigation, even for the smallest class of merchant-vessels, beyond 4 miles above Carmen.

The river is full of small islands and banks, the latter generally of sand. The former, when at all elevated, which is rare, are valuable for agricultural purposes, as the soil upon them is rich, and the proximity of water renders it moister than along the banks of the river and elsewhere. They are, however, generally

flat, and are partially if not totally inundated every high tide. There are eight hours ebb and four hours flood tide. The current down the river is very strong.

Floods occur twice during the year; once in December or January, occasioned by the melting of the snow on the Andes, the other in June or July, caused by heavy rains in the interior. The summer floods, when very strong, do much injury to the cattle and crops along the banks. They are, however, usually considered by the inhabitants, especially if they occur early in the season, to be of great importance and benefit, as they bring the only water they can depend upon to moisten the parched land and render it fit for cultivation.

The Rio Negro is a bar river. The bar is situated about $4\frac{1}{2}$ miles from the entrance, and is exceedingly dangerous to vessels passing over it. There are as many as six channels by which the water of the river discharges itself into the sea. Three of them have sufficient depth to allow vessels, drawing 11 feet of water, to pass safely over; and one has water for vessels drawing only 9 feet; the two others are of little depth, and are continually shifting.

Vessels drawing as much as $12\frac{1}{2}$ feet have occasionally passed and repassed the bar, but it is considered highly dangerous, and can only be accomplished at peculiarly favourable periods; but no vessel drawing more than 11 feet of water should attempt to enter the river, and not then unless there is a local pilot on board.

It is necessary to be remembered that though vessels drawing as much as 14 feet would be able to cross the bar and enter the river, after a succession of south-easterly or easterly gales, yet the wind necessary to enable you to leave it would have an opposite effect, and would lessen the depth considerably; therefore, if a vessel drawing that much water should ever be taken into the river, it is a great chance if she leaves it again.

The bar and the numerous banks at the mouth of the river are composed of quicksand, and their position is continually shifting; therefore no plan, however accurately surveyed, can be depended upon for more than a few months. The local pilot has two landmarks fixed on the N. bank at the entrance of the river to assist him in bringing vessels through the channels. He informed me that he is obliged to change their position frequently, especially after a severe gale or heavy floods.

Many places that were dry land a few years since are now covered with water, and *vice versa*. I was told that soon after the first settlement was formed, a lighthouse was built on the N. bank of the river; its site now is entirely covered by the sea.

There are many flat shoals and banks in the river between the mouth and the town of Carmen; they are composed of sand, and

in some few places on the N. side of the river, of sandstone, rendering the navigation of the river dangerous to strangers. There is, however, a local pilot paid by the Buenos Ayrean Government. This person has orders to board vessels before crossing the bar. Previous to the appointment of any regular pilot many vessels were lost on the bar and in the river; indeed its banks and the whole coast for some few miles on each side of the mouth are strewed with wrecks.

The ground on the N. side of the river is steep; the sandstone banks rising from 50 to 100 feet above high-water mark. The S. side, on the contrary, is perfectly flat from the entrance to beyond the town.

Fish are plentiful in the river and of various descriptions, two kinds of trout, two kinds of cat-fish, smelt, eels, perch, and a fish called a sucker, are numerous at and above the town, all of which readily take a bait. Salt-water fish are abundant at the mouth of the river, but are not frequently taken except by nets. No fish is salted for exportation.

A kind of gigantic rat, "nutria," is very common in the river. Many of the skins of this animal are exported, but the sum received for them is not considered very remunerative.

In the commencement of this Report I gave the amount of population of the town and settlement of Rio Negro. I saw nothing in the people worthy of notice, but excessive ignorance and idleness. The commandant of the garrison, as I have before mentioned, is unable to read or write, and the education of the inhabitants is no better. The men always, and occasionally the women, are expert "Guachos," beautifully skilful in the use of the "lasso" and "bolas," and first-rate horsemen. They are all ambitious of being good "Guachos," but that is their only attainment.

In the cultivation of the soil the idleness of the people is, perhaps, more apparent than in any of their occupations. Manure is unknown, though successive crops of grain are grown, the soil being annually enriched by the alluvial deposits. The plough used by the farmers (in shape somewhat similar to an English plough), is made of hard wood and is drawn by oxen, but it rather scrapes than ploughs the ground. The grain is sown broadcast in the months of April and May, and roughly raked over; it is then left to take its chance, nothing else being done to it until harvest, which generally commences towards the end of December and continues to the middle of January. The corn is cut with sickles close to the ear, and is immediately thrashed, or rather trodden out in the following manner:—The ears of corn are all placed in the centre of an enclosure of about 30 yards in diameter, and a number of mares, horses, and colts are then

driven in ; these animals are made to run round in this enclosure, trampling over the corn and treading out the grain ; making it, as can be imagined, most abominably dirty.

After these animals have sufficiently trodden it out, the grain is sifted by manual labour through sieves of various sizes to clean it from the straw and dirt. If it is used in this state, which they consider cleaned, I think it would be dangerous : indeed I found it so with the barley given to the horses, which were purchased for the use of this government, though every care was taken to procure the cleanest.

The land cultivated for the growth of corn is invariably along the banks of the river, on low and flat land, which could be irrigated with little labour ; yet year after year they suffer from the scarcity of rain, and frequently lose their crops.

The religion of the inhabitants is the Roman Catholic. There is at present one priest in the town, but previous to his arrival, in the beginning of the present year, they had been without one for the five previous years. The morality of the inhabitants is at a frightfully low ebb ; incest is not uncommon. Girls are frequently married by the time they attain twelve years of age ; the men seldom are married before twenty-five.

The duties imposed upon foreign goods of all descriptions are the same as at Buenos Ayres, excepting an additional 5 per cent., which is the perquisite of the customs and excise officer. Slight taxes are imposed upon venders of any description of goods or spirits, &c. The few public officers are nominally paid by the Buenos Ayresian government, but the receipt of their salaries is uncertain, which may probably account for the system of bribery so generally adopted by the small traders to the place.

I have had but little means, owing to the harassing duty upon which I was engaged and the short time I remained in the country, of procuring any detailed information beyond what regards the immediate vicinity of Carmen.

The soil along the banks of the river Negro, near the settlement, is rich and productive, of a fine dark brown almost approaching to black, of from one to three feet in depth, with a substratum of tenacious blue clay, from which bricks of an inferior quality are made ; and in other parts of the country, in the vicinity of the river, it is of a sandy earth, of from six inches to one foot in depth, upon very soft sandstone.

There are some few trees, principally willows of two kinds, red and white, and a description of poplar, along the banks of the river in sheltered situations.

Timber is scarce near the town, although at some distance up the river it is plentiful, good, and easily obtained. When required at the town, it is made into rafts and floated down the river.

I saw no stone adapted for building purposes ; indeed, there is no stone in the neighbourhood but sandstone, and that is of too soft a nature to be of use.

The country is covered with thick prickly bushes of four different descriptions, which average from five to seven feet in height ; of these the "*Piccallee*" is the most important, as it affords the inhabitants firing of a peculiarly excellent description ; it is very hard and burns without flame, producing as much heat as that from coal. The other sorts, though occasionally used as fuel, are not so good for that purpose, but are well-adapted for hedges, growing very thick, with long and sharp thorns. I have collected seeds of the several kinds.

The animals in the neighbourhood of the Rio Negro are of the same description as those usually found in that part of South America, but the most valuable are scarce in the immediate neighbourhood of Carmen, they being much hunted for their skins and flesh.

The "*Puma*," or lion of the country, occasionally commits depredations upon the flocks of sheep, calves, and colts near the town, seldom leaving a flock after having once commenced upon it. It is, however, a great coward, and is easily destroyed.

The chief defect in the general character of the country is the scarcity of fresh water. Springs there are none, and the only water that can be obtained, when away from the river, is rain water collected in wells dug for that purpose, in places where the ground is not impregnated with salt. These, though they hold water for some considerable length of time, are frequently useless owing to the great scarcity of rain.

The Indians, who formerly, and indeed till within the last seven years, were the great scourge of the Carmenites, constantly making incursions on the various "*estancias*," or farms in the neighbourhood of Carmen, and occasionally even on the town itself, murdering and committing many atrocities on the people, and carrying away all live stock which they could find, are at present more amicably disposed, but their friendship is rather purchased than freely given.

Large numbers of mares, cattle, and quantities of "*yerba*," and tobacco, are annually given as black mail to the Cacique Chaketi, who is the most powerful in the neighbourhood of Carmen, and the less powerful chiefs are propitiated in a similar manner.

Two or three different tribes, varying from 100 to 300 in number, visit the town twice during the year, but are not allowed to enter it in a body. They are made to encamp fifteen miles up the river, and are allowed to come into the town in parties of twenty or thirty, for the purpose of exchanging the woollen ponchos, horse-rugs, bolas, lassos, skins, &c., which they manufacture, and which are highly prized by the Spaniards, for aguardiente, yerba, tobacco, wool, and horses.

Formerly much silver was brought into Carmen by these Indians at their annual visits, but now it is uncommon among them in any quantity. Their spears and bits are occasionally, I was informed, now made of that metal, which they readily exchange for iron ones, perhaps requiring a small quantity of yerba, aguardiente, or tobacco, in addition.

The Indians frequenting the neighbourhood of the River Negro seldom have many good horses, though they possess mares in numbers: these are not kept for the purpose of breeding, but solely for food; their flesh, as I have before mentioned, being much preferred by the Indians to that of cattle.

They purchase many horses annually from the settlers at Carmen, but the latter are not allowed, neither is it their wish, to sell them any young or very serviceable animals; so that in case of an "émeute" breaking out at any time with the Indians they may be badly mounted; and as they never fight except on horseback, they would labour under serious disadvantages. At the same time the rulers of the province do not allow the Patagonians to be wholly in want of horses, as otherwise they invariably attack some "estancia," and carry off the best animals they can find.

There is a friendly tribe of Indians residing on the south bank of the river, immediately opposite to the town, who, during the attempted Indian extermination by the Buenos Ayresians, were induced by bribes to become their allies. This tribe is harmless, and not so treacherous as the other Patagonian tribes: they seldom commit any offences beyond the pilfering of ornaments or trifles. They are, however, not much to be depended upon except as spies, when, from their intimate knowledge of the country, their services are of great value.

Many mares, cattle, &c., are annually given to the "Cacique" of this tribe.

The Spanish settlers have many Indian slaves, male and female, who have been taken in battle by others, and sold by their conquerors at their visits to the River Negro. This slavery is not authorised, I believe, by the Buenos Ayresian laws, but the seat of government is so distant that little notice is taken of it.

The Patagonian Indians are passionately fond of ardent spirits, and many are reduced to perfect skeletons by using it constantly and immoderately. It seems to have a fearful effect upon them, and when under its influence they become perfectly mad for the time.

They are all excellent horsemen and well skilled in the use of the lasso and bolas, and the usual accomplishments of a "Peon del Campo." The intercourse between the sexes appears to be almost promiscuous. The greater authority a man has, the more wives he is entitled to.

Conceiving that a list of the price of the most important articles, the produce of the settlement of the River Negro, might be useful to the first settlers in the Falklands, I have drawn up the following list of prices of goods, &c., at Carmen:—

List of Average Prices of the following, at Carmen, Rio Negro,
February 1843:

	£.	s.	d.
Horses, broken-in and trained for the lasso, each .	2	10	0
Mares, each	1	12	0
Bullocks „	1	0	0
Mules „	2	10	0
Sheep „	0	2	0
Goats „	0	1	6
Pigs „	0	8	6
Wheat, per fanega, containing rather more than three bushels	2	0	0
Barley ditto ditto ditto	1	4	0
Indian corn, ditto ditto ditto	3	0	0
Onions, per thousand	1	7	0
Potatoes, ditto (do not thrive well)	1	5	0
Garlic, ditto	0	0	4
Pumpkins, each	0	0	5
Melons „	0	0	3
Vegetable marrow „	0	2	0
Salt, per fanega			
Apples . }	average price per bushel .	0	6
Pears . }			
Nectarines . }			
Peaches . }			
Grapes . }			
Figs . }			

IX.—*Course of the Hume River, from the Hilly Districts to the Junction of the Morumbidgee.* By Captain CHARLES STURT.
Communicated by Lord STANLEY.

WHEN, in the year 1838, I made up my mind to conduct a party overland from New South Wales to South Australia, I determined on making my private interest as much as possible subservient to geographical research, by tracing the Hume, downwards, from where it crosses the main road to Port Phillip, to the mouth of the Morumbidgee, at which point it loses the above name and becomes the Murray. The distance being about 260 miles, I was anxious to ascertain the nature of the country along this its unknown course, and by fixing the points of junction of its several tributaries, to complete the survey of the streams falling into the interior from the S.E. angle of the continent.

I accordingly assembled my party at the lowest (highest?) station on the Hume in the month of April, 1838, and commenced my journey by moving along its right bank and following it in a westerly direction into the low and depressed interior. In latitude $34^{\circ} 48' S.$, and in longitude $146^{\circ} 3' E.$, we passed the junction of the Ovens, a small river coming from the S.E., and consequently falling into the Hume on the opposite bank to that along which we were travelling. We had already cleared the hilly country, and now found the river flats backed by extensive plains, traversed by belts of trees, and covered with salsolaceous vegetation. The river held a course rather to the northward of west, the descent being still considerable. About 25 miles below the junction of the Ovens, however, the current in the river became feeble, its waters were turbid, the flats along its banks expanded, and appeared subject to inundation, and detached masses of reeds were scattered over them: these, at length, almost covered the primary levels, and, by the increasing height of the rings upon the trees, we judged that we were pressing into a region subject at times to deep and extensive floods. Accordingly, as we advanced, the reeds closed in upon us, and we moved through them along narrow lanes or openings which the natives had burnt, the reeds forming an arch over our heads, and growing to the height of 18 or 20 feet. Our progress was impeded by hollows, and the flats were intersected by channels for carrying off the back waters from the extremity of the alluvial flats.

On the 23rd of May, in latitude $35^{\circ} 52'$, we were suddenly stopped by a small junction from the N.E., which the natives (numerous hereabouts), called the "Delangen." They informed us that the country to the N. was under water, as indeed its appearance indicated, and that the country in front of us was impassable. It was in truth an open expanse of reeds, into which the Hume directly led. In the event, therefore, of our being unable to proceed to the N.W., it would here become necessary for us to cross the river; but, as I wished to ascertain the nature of the country upon my right before I determined on this step, I sent my old follower Frazer into it, who reported to me that it would be idle to attempt a passage with drays, for that it was traversed by deep creeks full of dead timber and masked by reeds, and that the further he proceeded, the softer did the ground become under his horse's feet. We were therefore obliged to cross the Hume a little above the junction of the small stream which had stopped us. On the left bank, however, we were still in the midst of reeds, through which we could not have pushed but for the narrow lanes made in them by the natives. We could not, however, approach the river for two days, and when we again came upon it, it was just issuing from a vast marsh; its waters were muddy,

and its channel considerably diminished. Instead, however, of holding a course to the westward, the Hume at this point suddenly changed it to the eastward of S., flowing through a barren country of white tenacious clay, above the reach of flood, but of the most gloomy character. It had just been fired by natives: the trees were scathed to their very summits, and the trunks of those which had fallen were smoking on the ground.

On the 20th of June, the river still running to the eastward of S., we suddenly found ourselves stopped by a deep river of some size, most beautifully fringed with acacia of a dark green hue. This was the Goulburn, which we had struck about a mile above its junction with the Hume, in latitude $36^{\circ} 3'$, and in longitude $144^{\circ} 58'$.^{*} On crossing the Goulburn, I found that some other over-land party had been here before me, and at the junction saw that Mr. Bonney had cut his name on one of the trees. It appeared therefore that he and Mr. Hawden had taken the line of the Goulburn on their way to South Australia: instead, however, of keeping the banks of the Hume, these gentlemen crossed the hard and extensive plains which surround the hollow through which the Hume flows. On the other hand, I kept to the river, encamping on its banks every night, sometimes without firewood, the weather being cold and frosty. We traversed a country subject to flood, of a blistered soil, and heavy for the teams to drag through, and we at length once more got into the region of reeds.

On the 30th of June we sighted Mount Hope, of Sir Thomas Mitchell, bearing S.W., distant about 14 miles; and lost sight of it on the 5th of July, bearing S.S.E., distant about 18 miles. At this point we could see some lofty trees to our left; but we were in the midst of reeds, which extended over an immense flat, bounded in the distance by a dark belt of Eucalypti, the intervening space being one entire marsh. On the 9th of July we came upon a small river, with steep earthy banks, which I presume to be the Whimera of Sir Thomas Mitchell, on whose tracks we got the following day, about 2 miles to the westward of its junction with the Hume. I could not observe any impression of horses or cattle to indicate that any one had been there, but discovered the marks of horses' hoofs lower down the Hume, at a division of its channel where it forms several flat and reedy islands.

I made a report of this journey to Sir George Gipps, on my return to Sydney, but I did not at that time forward any chart; I have now, however, the honour of enclosing one.

I should state that the river is navigable along its whole

^{*} The MS. has $146^{\circ} 58'$, evidently a clerical error.—Ed.

course. The flats, which extend to some distance on either side of it on its upper branches, are rich in soil, and are better adapted for cattle than for sheep. Many fine stations might indeed be formed even to the junction of the Delangen; and, as in the cases of the Morumbidgee and the Macquarrie, I have no doubt the settlers, as they want pasturage, will push down to them. I do not, however, think that any of the country from the Goulburn to the junction of the Morumbidgee is available for any purpose. The only object gained by me in pursuing the river was the survey of it, and the connexion of its higher branches with its lower ones, as adding more correct data for a chart.

X.—*Route from Turbat Haideri, in Khorásán, to the river Heri Rúd, on the borders of Sístán.* Extracted from the Journals of the late Dr. FREDERICK FORBES, E.I.C.S.

[Dr. Forbes's Journal, kept with great care and perseverance during his travels in Mesopotamia, and his journey from Trebizonde, by Tehrán and Mesh-hed, to the banks of the Heri Rúd, near the Lake Zerreh, is well deserving of publication; but as the greater part of it describes routes already known by the narratives of former travellers, and a part of it has been printed in the 'Journal of the Royal Geographical Society,'* the only portion which could be given in this volume is that which carries the reader over untrodden ground, by a new route, through the southern part of Khorásán, a country rarely visited by Europeans. These notes, put down in the short intervals snatched from rest and visitors during long and harassing marches, show such unwearied ardour in all useful inquiries, and are so clearly and agreeably expressed, as to have required nothing but a few verbal corrections, for which, as for the orthography † of the Persian words and names, and the foot-notes added, the Foreign Secretary must be held responsible.]

The journal mentioned above, fills two small quarto volumes of 168 and 146 closely-written pages. An account of the visit to the Sinjár (Shinear of Scripture) hills, E. of Móqul (properly Mauşil), in 1838, and daily remarks made on the road from Trebizonde to Tehrán, and during a short residence there in April, 1841, fill the first, and the second volume contains the remainder of Dr. Forbes's journal kept on his way from Tehrán through Mesh-hed, where he also made some stay, and Turbat Haideri, to the banks of the Heri Rúd, where his remarks terminate abruptly, on Saturday the 26th of June, 1841.

As this was quite a private record of what the traveller saw and experienced, it could not be printed without some revision, and perhaps a few explanatory notes; but the liveliness and perspicuity of the narrative, amiable traits of character, judicious observations, and variety of objects noticed in almost every page, make the reader deeply lament the premature termination of Dr. Forbes's life and labours: and though preceding travellers have described the former part of his route, it can scarcely be doubted that the publication of his remarks would be an acceptable addition to our knowledge of the countries through which he passed.—F. S.]

*June 6th, 1841 (Trinity Sunday).—*Having assembled our party in the afternoon near the shrine of Haider,‡ we left Turbat

* Vol. ix., p. 469.

† Which is the modification of that established by Sir William Jones and Sir Charles Wilkins, generally followed in this book; the consonants are sounded as in English, vowels as in Italian and German.

‡ Kothu-d-din Haider, a descendant of Sefiyu-d-din of the race of Husein, second son of 'Alí, was the father of Ismá'íl Hefi (improperly called Sophi), founder of the Safavi race of kings in Persia, who from him are also called Haideris. He first introduced the use of the red shawl twisted round the cap in twelve folds, whence the Turks gave the Persians the name of Kizil-bashes (Red-heads).—D'Herbelot, Bibl. Orient. v. Haider. The proper name of Turbat (i. e. the Sepulchre) is Závéh.—Jehán-mumá, p. 319.

Haideri at 8 o'clock, soon after sunset, and kept 170° E. (S. by E. $\frac{1}{2}$ S.) through lanes and gardens, till, proceeding in the same direction, we passed over broken ground and ravines, and then crossed some low rounded hills, in a S.E. direction, which brought us into an extensive and perfectly level, clayey, sandy, naked plain, with here and there a scanty sprinkling of aromatic plants. The castles and villages of Hind-ābād and Moḥammed-ābād, about 11 and 12 miles from Turbat respectively, were surrounded by fine fields of ripened corn. The latter must at one time have been a place of strength and importance, though now in ruins, if one might judge from the height and solidity of its square outer wall, surrounded by a deep and wide ditch. It has also a second or inner wall, and the whole is commanded by a lofty and massive tower in its centre. The present inhabitants of these and several other villages in this district are of I'liyāt race. From thence we advanced towards the rounded end of a chain of hills, or rather a single hill, of considerable length, said to be half-way between Khāff and Gunābad;* passed the castle of Gīet, or Kīet,† inhabited by I'ls; and, keeping through fields in which most of the crop was already cut, and collected on the threshing-floors, halted, a little before 2 A.M., on Monday the 7th of June, in an extensive meadow about half a mile from the village, knee-deep in natural grass, to get a few hours' sleep and recruit our cattle, having as yet only got over about half our journey to Fazlmand.

7th.—Having left our halting-place at 5 A.M., soon after sunrise, and kept a southerly course through meadows and broken ground, after crossing some water-courses, into one of which one of my mules fell, and my baggage had a very narrow escape from being thoroughly drenched (such a misfortune being about the last that one would have expected in a country so parched and arid as this), we reached, at a quarter before 7 A.M., the wide gravelly bed of a river called the Fazlmand Rūd (Fazlmand river). It is the stream which rises from the Pass of Kāmeḥ to the N. of Turbat, and flows eastward of that town. In striking across the country by a shorter path, we had here altogether lost our way, and kept for some time along the bed of the stream, filled with tall reeds and tamarisk-bushes. On approaching a rocky height, some of the more timorous of our party, of whom we had not a few, raised an alarm that horsemen were in sight, having been deceived by the dark shadows of the rocky clefts in the morning sun. We therefore sent out horsemen on every side to reconnoitre the ground, which was certainly in every way favour-

* This place is also called Junibad. Its proper name seems to be Tunjah (i. e. Little Tūn).—*Jehān-numā*, p. 376.

† Perhaps Gīyet or Kīyet.

able to the concealment or attack of a hostile party, being hilly and broken, and full of deep ravines and gullies, the dry beds of rain-torrents. The only fruit of our search, however, was the discovery of a few cows grazing in a hollow. At 10 minutes before 7 A.M. we got into the path of which we were in search, and keeping S., at 8 A.M. reached Sha'beh, half in ruins, and surrounded by traces of former extensive cultivation, having at the same time the ruined village of Ushturán (Camels) half a mile to the right. We soon afterwards passed the ruinous and deserted castle of 'Alí-ábád ('Alí's abode), surrounded by fields of barley nearly ripe, and near them a party of people in tents, who had come to reap the corn. The ruined castle of Sa'ad-ábád lay at some distance to the right. Having got a draught of dūgh (butter-milk), we proceeded in the same course, and at 9 A.M. reached the castle* of Fazlmand.

Not being able to get any tolerable accommodation in the confined and filthy houses there, we moved onwards about a mile further, to a meadow on the bank of the small stream already mentioned, where we found a party of horsemen in the service of the serdár † of Turbat, who gave up to us two small tents. The difference of temperature between the plain of Turbat and that containing the villages of Hind-ábád, Mohammed-ábád, Fazlmand, &c., is so great, that while the former was covered with snow, the latter was fresh and green, although they are only separated by a narrow chain of hills of no great height.

Fazlmand contains about forty families; and as it possesses two *kanáts* (artificial water-courses) of brackish water, a good deal of ground about it is cultivated. Its inhabitants are chiefly I's, with a few Kizil-básh (Red-heads, *i. e.* Persians) *ri'ayyats* (*i. e.* tributaries). A party of sixty *Timúrí* horsemen is stationed here to watch the movements of the plundering hordes of *Turkománs* from Merv. The water of this small stream (which, when full, runs by Jangal, but is lost in the desert) is here brackish. *Assa-fetida* of indifferent quality is said to be gathered between this place, Turbat, and Gunábad. Little or no game or other wild animals are found in this district, with the exception of the *gúr-khar* (wild ass, or onager) and the wild boar. I passed the day, though warm, pleasantly enough. The *suwár báshí* (head horse-soldier), who waited on me, sent me a present of a lamb; and we had brought a quantity of ice in the *túbrahs* (saddle-bags) from Turbat, which here proved a great luxury. In the evening, also, I bathed in the stream, and felt much refreshed by it.

8th.—We left our ground at 35 minutes before 1 A.M., and, crossing the stream, kept a generally southern course, winding

* Kal'ab.

† Military commander.

among sandy hills covered with tamarisks, and then over a dry naked plain, bounded to the right by low rocky hills. Our guides, of whom we had two, were constantly reminding us that the roads here were very unsafe; but they said they had chosen the lower and more level of two as the safest and best. We therefore muffled the bells of our baggage-mules, and moved on in a close body. We heard the cry of some wild asses, but could neither see them nor stop to look for them. At half-past 3 A.M. we passed the ruined and deserted castle of Jennet-ábád (Paradise Place), which might now be more fitly named Jinn-ábád (Demons' Place). It stands in the level plain, and a little way beyond it we came to an empty tank (*hauz*). When we halted for the Muselmán namáz or prayer, there was a long discussion among some of our party about the direction of the Kiblah (the bearing of Mecca, the point to which they ought to turn in prayer). One or two of them had turned their faces westwards, and the others followed their example. One from Kandahár took a star (Sirius) for his guide, supposing that its direction would be the same wherever he might be; and he said that they were so taught by the móllás (doctors of the law). Another had a Kiblah-numá,* or compass, made at Isfahán, for that place, and fancied that change of place made no difference in the matter. After proceeding in the same direction, and passing over much ground that had been under cultivation, we reached, at 5 A.M., the castle of Jangal Haider-ábád (Haider-ábád-wood), the whole population of which appeared to have turned out to witness our arrival. I had tolerable quarters in a long narrow room, with several openings to the N.E., serving as ventilators or bád-gírs (wind-catchers). This was part of a building dignified by the name of the mesjid (mosque), the court of which contained a large covered tank (*hauz*) of rain-water. I had a visit from the yúz-báshí (centurion) of the suwárs (cavalry) stationed here, at Gunábad, and Fazlmand. He was very civil and attentive, and is a son of the náyib (chief) of the nearest of the cluster of villages named Gunábad. He gave me a letter to his father. He said that Tabas is 60 farsangs (220 miles) from hence, and Tún 14 farsangs (44 miles).

The people of this place are very poor and miserable. As there are no wells or *kanáts* (water-courses), they depend entirely on the rain for their supply of water; and if that fails, or is scanty, little or no corn can be raised, so that their fields sometimes lie untouched for years together. From the strong saline impregnation of the soil, all their water is brackish. The harvest

* Literally "Show-Kiblah." A line across it shows the direction of the Kiblah, with respect to the meridian of the place for which it is constructed. It is not properly a compass.

here is generally reckoned at 80 days after the Nau-rúz * (29th March—1st April), and the crops are now ripe. At Fazlmand they ripen at about the same time, and at Hind-ábád, Moḥammed-ábád, and Kiet, 10 days earlier.

Jangal, or, as it is commonly called, Jangal Haider-ábád (the Wood of Haider-ábád), belonged to the late 'Tsá Khán, who built and peopled it. Since his death it has gone to ruin, and may now contain about forty families within and without the walls, half 'Is and half Kizil-básh ri' ayyats. This village is now the property of the Ḥazrat Imám [Rizá], but the rapacity of the priesthood † is more ruinous than the violence of other temporal proprietors. There is a large bund, or dam, in the hills above Jangal, which formerly supplied water for the cultivation of corn to the extent of 2 or 3 miles round the place, but it is now out of repair. The estimated expense of repairing it is about 1000 tóman (500*l.*), and the increase of annual income to the proprietors would be about 3000 (1500*l.*), yet they never think of laying out the money. ‡ The distances from hence are—to Róshanáwan, 7 farsangs (26 miles); to Gunábad, 13 farsangs (48 miles).

Intending to move to Róshanáwan in the evening, as the march was long and waterless, I got two horsemen from the yúz-báshí to accompany us, and set out at a quarter before 6 p.m., keeping a W.S.W. course over a level plain, with some cultivated fields to the right, protected by sundry towers. We passed by the ruinous and deserted castle of Sangál, half a mile distant on our right, and continuing through sandy and broken ground, reached a covered tank (*hauz*), where we halted for evening prayer (*namáz*) at a quarter past 7 p.m. As our road to-night was said to be particularly exposed to visits from the Turkománs, we took the precaution of having a *ḡaráwul* (sentinel) and rear-guard, muffling the bells of the mules, and forbidding smoking. We now proceeded over sandy ground covered with tamarisks, in a S.W. direction, towards a dead level with a smooth, clayey, naked surface. Soon after midnight we had a conical hill, in a low range, 3 miles on our right, and a ruined tank (*hauz*) to the left of the path.

9th.—At 1 o'clock a.m. we reached our halting-place, Rósha-

* Literally "New (Year's) Day," the Persian term for the Vernal Equinox; strictly, the day on which the Sun enters Aries: it is now kept either at the end of March or the beginning of April.—Fraser's *Khorasan*, p. 214.

† Dr. Forbes meant no doubt the *móllás* and *derwáshes* who are employed to pray at the tomb of Imám. Though the Muselmáns have religious orders and endowed mosques and oratories, they have no priests or priesthood.

‡ Probably because any profit they might make would soon be absorbed by *aravánas* or extortions imposed on them by the agents of the Sháh. This seems to have escaped the author's notice.

nāwan, and I went to sleep in the cool air, in an enclosure which surrounds the outer part of the village. Róshanāwan, as well as several other villages, belongs to the Hazrat Imám,* and was farmed, together with six or seven more, to the amír of Káyin for 2000 tórnás (1000*l.*) per annum; but this year, these villages have been put under the superintendence of men appointed by Hájí Mirzá Músá Khán, guardian of the property of the Imám Rízá at Mesh-hed. One of these men is now here to look after the produce of the harvest, which they are now reaping. In these villages the owner takes three-fourths of the produce (wheat, barley, and cotton), and leaves the remainder to the cultivators.

Róshanāwan consists of about forty houses, mostly outside of the castle, surrounded by a slight mud-wall. There is a good mosque, and also a fine tank (*hauz*) of burnt brick, which is only opened in the hot weather. The supply of water is regulated and drawn off by a large brass cock, to prevent waste; and this is the only place in the East where I have seen that contrivance applied. The water is as cold as ice. This mosque and tank were built only about 100 years ago (A.D. 1740, A.H. 1154), but the name of their builder, the benefactor of the place, is already forgotten. There is a scanty supply of slightly brackish running water from a spring in the high ground to the W.

I had a visit from the steward or man employed by the proprietor to overlook the affairs of this and the other villages. He was an old sayyed (sheriff, or descendant of the Prophet) and hájí (pilgrim), who had been formerly a merchant, and had seen a good deal of the world. He was intelligent, and free from much of the bigotry and prejudices of his caste and country. In consequence of the want of rain this year, the crops have been unusually scanty, and the hájí said he should be content to take 70 per cent. of the quantity usually produced; and in the evening the reapers, when they returned from their work, brought several baskets of blighted and half-filled ears of corn as a sample of the crop, to induce the hájí to moderate his demands upon them. I had many applications for medicine, and saw one or two dreadful cases of siphylis, which in this country appears still to retain much of that virulence which at one time made it so much feared in England.

At 11 o'clock P.M., soon after the moon rose, we set out, and proceeding W.S.W., in the direction of some low hummocks, passed through ground that had at one time been under cultivation.

10*th*.—At 10 minutes past 1 A.M. we had the castle of Naukár

* See p. 149. The Turbat or Tomb (properly Tumulus) of the Imám Rízá is richly endowed for the maintenance of móllás (doctors) and dervishes, who day and night perform religious services beside the shrine.

on the right; and afterwards taking a W.S.W. course, passed a mill, some huts, and a tower near a small brook, by the ruins of a village. From hence we kept along the flat, bare, and clayey plain in a south-westerly direction, and at half-past 2 A.M. reached the gardens of the nearest of the Gunábad villages, and at a quarter past 3 A.M. the village of Delúwí itself.

We were kept a long time waiting for quarters, as the *náyib*, or *ketkhodá* (head-man), could not be found; but at last I got good quarters in the house of a weaver, and was soon afterwards visited by the *náyib*, an old *hájí*, father of the *yúz-báshi* at Jangal. He was followed by several large trays of mulberries, plums, and apricots; and soon afterwards by a good breakfast, which was the more acceptable as, with the exception of the mulberries, the fruit was barely ripe. The old man himself was very kind, attentive, and good-humoured, but wanted the intelligence and education of the merchant *hájí* of yesterday. He paid me several visits in the course of the day, accompanied by a train of his followers, whose curiosity was most childish and boundless at everything I showed them, from a compass to a bit of India-rubber; gaping with open mouths, in the utmost astonishment, and pouring in a continual succession of questions, some of them most ridiculous. The only exception was an old weaver, who appeared a particularly acute and intelligent man, and questioned me much about our laws, government, &c. The weavers here struck me very much as resembling a class of operatives in Scotland, now fast disappearing, the hand-loom weavers—as similarity of habits, no doubt, begets similarity of disposition to some extent. They all appeared intelligent, given to politics, disputatious, and possessed of a quaint and independent humour very different from that of the generality of Persians. The three points in our laws and customs which most surprise and puzzle the Orientals are, the inheritance of our throne by a queen, the absence of slavery or vassalage, and the prohibition of polygamy. The old man joined me in maintaining the advantages and expediency of monogamy, and said that, although some took as many wives as they could keep, yet, apart from their law, and as a matter of common sense and prudence, one wife is sufficient for every man.

The products of this place (which is 40 farsangs [150 miles] from Tabas, and at a like distance from Mesh-hed, Bihjá,*, and Herát) are silk, fruit, opium, and cotton. Much coarse white cotton-cloth is also made here, the bulk of the population being weavers.

* The name of this place, a corruption of Míhrján (*Jehán-namá*, p. 330), has been changed by our Indian travellers into Bbeerjoon, Beerjoon, Beerjund, Burjund, Burjun, &c.

Delúwí is a large village, with a ruinous castle* and about 100 houses, and numerous gardens well supplied with water by subterranean water-pipes.† It is about 1 farsang (4 miles) from Júmín, the residence of the náyib, or khán (chief), of Gunábad, and 4 farsangs (14 miles) from Róshanáwan.

I had many visits in the course of the day, and a good specimen of the extraordinary ignorance among the Mohammedans, even of some who have pretensions to learning, and might be supposed to know better. A sayyed gravely asked me whether we English perform the hájji, or pilgrimage to Mecca.

Delúwí contains about 300 people of Arab race, the hájji himself being one of them. He pays to the sháh for this village 30 Khorásán, = 70 'Irák tó máns (35*l.*), and 70 kharwárs‡ of grain. The opium obtained here is of an inferior quality; tragacanth and galbanum are found in the neighbourhood, but no assafœtida. Two of the hájji's sons were carried off by the Turkómáns some years ago, and it cost him 150 tó máns (175*l.*) to ransom them. They are at present in the hills with the flocks. The heat was so great that I was driven to the roof for the night.

11th.—We left Delúwí at 12 p.m., soon after the moon had risen, and kept in a southerly direction through corn-fields. At half past 12 we passed Gunábad, which has the rank of a town: its houses and gardens cover a great extent of ground. The castle is large, with very strong and lofty mud walls and towers. The whole cluster of the neighbouring villages is named after this place, though the present residence of the hákim (governor) is Júmín. Gunábad was formerly the property, or at least in the jurisdiction of Hájji 'Alí Naqí, khán of 'Ábas, but it was taken from him about a year ago by the amír (prince) of Káyín; and, after some fighting on both sides without loss of life, was taken from both by the Aşef-ed-dauleh (prime minister of the sháh), who has since kept possession of it; but the place has suffered much. The inhabitants of the town of Gunábad are Persian ri' ayyats (tributaries). From Gunábad we kept a south-westerly course, and at 4h. 10m. p.m. reached the town of Kákh, after a slight ascent, and got quarters in the small and only cár-raván-serái which it possesses; the owner of which, a sayyed, was very civil and attentive. I had a visit immediately afterwards from the náyib, a morose, puritanical-looking sayyed and móllá, with his son, an agreeable, intelligent lad. The náyib had been in Mesh-hed when Riach arrived there about the surrender of Ghóriyán, and, taking me for that gentleman, as I was also a hákim, began a long string of inquiries about the arrangement

* Kal'ah.

† Káriz.

‡ One kharwár (ass-load) is equal to about 725 lbs. English; but as no ass could carry such a load, the term may perhaps be used merely to denote a great weight.—F. S.

that had been made with the sháh, until I undeceived him. The town of Kákh, or Kágh, is situated on a rising ground at the base of a range of hills, and contains about 300 houses, four good mosques, two of which are large and well-built; two colleges,* six baths, forty tanks (hauz), and several water-courses (kanáts). The shrine of Imám Záhedi Sultán Mohammed is a fine building. He was a brother of the Imám Rizá. The original building was erected by one of the Sámánian kings, but enlarged and rebuilt by Sháh Ismá'il Safaví. The imám's tomb is covered with brocade, and a number of móllás are constantly employed in reading the Korán near it. It has, however, fallen much into decay, especially the dome; of the inscription round which, formed of lacquered tiles, a large piece has fallen away. Some time ago a person left a sum of money for the repair of the tomb, but, as is usually the case with respect to bequests in Persia, as in other places, it was misappropriated; and what was laid out sufficed only to collect some materials for the work, and to erect a scaffolding round the dome, which will remain till the rotten wood-work increases the ruin which it was intended to prevent or remedy. The chief mosque† was erected by a sayyed, a native of the place, in A.H. 1180 (A.D. 1766), and has a good college‡ attached to it. Provisions of every kind are cheap and abundant here (I bought three sheep for my people for 3s. 6d.); but the inroads of the Turkománs, and the want of a ready market for the produce, keep down industry. About 1000 Káyin, or 500 Khorásán mans (7500 lbs.) of opium are gathered here annually, and it sells at from 3 to 6 kírás per man: being cheap this year, on account of the non-arrival of traders or caravans § from Bokhárá, who used generally to buy up all the quantity produced, most likely for the China market. The opium yielded by poppies raised without irrigation is finer and dearer than that collected from plants which have been artificially watered. The juice, cleaned from impurities, is called shera'-i-túryák,|| and sold in small cakes at from 16 sháhís¶ to 1 old kírán the sér.**

In the evening they furnished me with most original-looking candles, being reeds wrapped round with clouts of cotton thread, and dipped in tallow. From the neighbouring villages about 2000 Khorásán tóman (of 25 Fat'h'ali sháhí kírás to the tóman), 2500*l.*, are annually raised by the government.

12th.—We left Kákh at 1 A.M., and kept a S.S.W. course between low hills, towards a pass which we reached at 1h. 40m. A.M.

* Medreseh. † Mesjid-i-jum'ah. ‡ Medreseh. § Kerásas.

|| Legal theriacal. ¶ Equal to about 3 riyals or rupees=4s. 6d.

** 1 sér=6 miskáls=18 miskáls of Tabriz; and 40 sérs=1 man=360 miskáls=720 Tabrizí miskáls=7 lb. 10 oz.; 1 man sháhí=15 lb.

It was steep and difficult, and the descent on the other side bad. Having got out from among the hills to the edge of the plain of Ním Ballúk, we halted at 3h. 15m. to allow the loiterers to join us. At 4 we halted again, opposite to the village of Ǧal'ah Sangúrî, half a mile distant on the left: all the occupants of which, chiefly women, appeared to be assembled on the walls, watching our motions, and evidently not a little suspicious of our intentions. Having proceeded at 4h. 5m. in the same direction, at 5h. 15m. we reached the village and castle* of Deshti Piyáz. I took up my quarters in the mosque, but finding the place uncomfortable, and hearing that the brother of Nejez Khán was at Khidrî, only $2\frac{1}{2}$ miles distant, I determined to move onwards to that place, much against the will of the rest of my party.

Deshti Piyáz is a large village, and one continued garden of mulberry and fruit trees. It contains about 100 families of Ǧizil-báshes, and belongs to Káyin. Its products are fruit, silk, a little cotton, and opium. Near the principal mosque there is a magnificent chinár (plane-tree), about 12 feet in diameter. The extent of cultivated ground here was formerly much greater than at present, as is shown by the traces of the plough and dry water-courses and kanáts in the plain.† We set out again from Deshti Piyáz at 5h. 55m. A.M., on a course S.E. by S., towards Khidrî, which we reached at 6h. 30m., but met with a very inhospitable reception, and it was only after waiting about an hour and a half, that I got a shady spot under a tree in a garden to spread my carpet on. I had a visit from the náyib, a brother of Nejez Khán, who offered his services when I no longer wanted them; he, however, sent me a breakfast, and the present of a diseased goat, which I returned to him, as none of my party would look at it. The animal had probably remained in the village from being unable to accompany the flocks to the hills.

Khidrî, or Khidr Beg, contains about 100 houses outside of the ruinous castle, chiefly occupied by Arabs and shepherds; and they had a number of black tents pitched outside of the village, like those used by the P's‡ for their dairy operations. The náyib could give me no account of his race; from whence or when they had first come into this country; but said he believed that his ancestors came from the neighbourhood of Maskat. There are here some extensive gardens of mulberry and other fruit trees; and a little silk of good quality, barley, wheat, and turnips is produced. The people complained much of poverty, and said they had only barley-bread, mulberries and turnips to eat, and that they prayed that we might come and take the coun-

* Ǧal'ah.

† Artificial channels for water.

‡ Like those of the Yúruk or migratory Turkománs in Asiatic Turkey.

try. I told them that it was scarcely such an one as we should covet. Some apple-trees bore a fine crop; but the fruit was small, and without flavour. The crops are not yet ripe here: the tragacanth grows in the hills, but the gum is not gathered: a little sesamum is cultivated for its oil, as well as at Kákh, where the castor-oil plant* is also grown. Raw silk is sold here at the rate of from 6 to 10 *ķiráns* for a man of 40 *sérs* of 9 *miskáls* each. The wild ass,† in herds of from 40 to 50, abounds, and wild boars are so numerous that they destroy half the crops; and the *náyib* complained that, although all that could be found were killed, their numbers never appeared to be diminished. There is a very great difference between the temperature of Khidrí and Gunábad: here the cold immediately after sunset was very unpleasant.

13th.—We loaded, and set out about 1h. 55m. A.M., and kept a course S. by E. over a plain strewn with loose stones and gravel, and at 4h. 30m. entered a narrow winding defile, running between steep hills, through which runs a small brook, bordered by wild roses and sweet briars, barberries, willows, and tamarisks. After ascending for an hour and a half we reached, at 5h. 30m. A.M., the highest point of the defile, where there is a ruinous stone-tower, probably occupied formerly by a guard for the defence of the pass. From hence we kept a W. direction in our descent. At 5h. 40m. A.M., where the ravine opens a little between the hills, we had a bare, reddish, rounded hill of a very singular appearance on the right, about 200 feet high,—the deposit from a calcareous spring called here *Tursh-áb*.‡ On ascending the hill we found the summit flattish and rounded, about 6 yards in diameter, occupied to within a couple of feet of the edge by a pool of discoloured water, from nearly the centre of which issued a considerable body of clear water, mingled with much carbonic acid gas. The depth of the basin was about 2 feet; the temperature of the mixed water and gas, where it issued, 53° Fahr.; its taste slightly acid and pungent, with a very faint earthy odour. None of the water finds its way to the bottom of the hill; the calcareous matter, which it contains in great abundance, being rapidly deposited in a solid form, and the aqueous part evaporated. The whole of a large hill above that which contains the spring, is a deposit of the same kind, rising to a height of between 300 and 400 feet, but of an old date; and the valley below, for the distance of nearly a mile to the S., is strewn with huge blocks of it. Much of the older formation is translucent and colourless: the later is deeply tinged with iron. This

* *Bedanjir* (for *bádenján*, properly the egg-plant: *kharwa'*, or *khará'*, is the *Palma Christi*).
 † *Gár-khar*.
 ‡ Sour water.

spring is said to cure all sorts of diseases; and the people, when sick, resort to it from the neighbouring villages. Having rejoined our party, at five minutes before 6 A.M., we kept a south-western course through a narrow valley, containing one or two brackish springs; the declivities of the hills on either side being cultivated in patches for the dry, or *dáymeh* (permanent) crop, which, however, from the failure of the rains this spring, is a miserably scanty one. When the rains are abundant the *dáymeh* crops are said to yield sometimes fifty for one, and the quality of the grain is far superior to that obtained by irrigation.

At ten minutes before 7 A.M. we reached Nokab, where the old *Rísh sefid** or *Keikhodá*† was as deaf as a post, but a hale, active-looking man, and we had great difficulty in getting supplies. Nokab consists of two divisions; one on each side of a hollow; the castle being in the midst of the southern one, but quite ruinous. The inhabitants are Arabs of the *Káyin* tribe,‡ those of *Khidri* being from *Neh* or *Nehbandán*. There were a few black tents pitched outside of the village. A considerable quantity of saffron is produced here, and a little silk; the saffron, however, can hardly be a very profitable crop, as a man brought to me for sale the whole produce of two tolerably sized fields in a small handkerchief. He told me that the root of the crocus decays in about ten years; but by that time, it has produced a numerous progeny which are planted out anew. The dried saffron, cleared from impurities, sells at from five to eight *miskáls* per *sháhib-kirán*. The chief place, however, for the cultivation of saffron, is about *Káyin*, and at the village of *Béhúdah*, about 2 farsangs ($7\frac{1}{2}$ miles) east of Nokab. There was a violent thunder squall, with a few drops of rain, in the afternoon. As the path between Nokab and *Teghab*, which is called 2 farsangs ($7\frac{1}{2}$ miles), is in many places so broken that it cannot be safely attempted at night with laden cattle, we determined to move onwards in the afternoon. A horseman who had come in the direction of *B'hirján* § [*Bibrján* for *Mihirján*], brought a long story about a chappáo [incursion] made in this quarter by 2000 *Turkomán* horsemen, which had frightened a man on his way to *B'hirján* out of his wits, and he proposed to accompany us. We left Nokab at 3h. 30m. P.M., and ascended the hills S. by E. by a very narrow rocky path, and at 5h. 10m. having ascended an elevated ridge, got out upon the edge of an

* Grey-beard. † Deputy. This word in Turkey is pronounced *kyahyá*.

‡ The author no doubt meant of the same tribe as those established at *Káyin*, as there is no tribe of Arabs bearing that name. This is evident by what he says of those of *Khidri*, who are from *Neh* or *Nehbandán*, a Persian, not an Arab name.

§ Various spelt by our travellers *Bheerjoon*, *Beerján*, *Bhurjund*, *Burjun*, &c. It is doubtless the Persian word *Mihirján*, commonly pronounced *Mihirjún* and *Bihirján*.

extensive plain stretching from N.W. to S.E. of considerable breadth, and bounded on all sides except the N.W. and S.E. by high, bare limestone-hills. At 5h. 20m. we had Dostábád about 5 miles, and Seráyán, the frontier village of Tabas, about 2 farsangs ($7\frac{1}{2}$ miles) N.N.W. of it, on our right, and keeping along a hard, bare plain, with a very gradual descent, at a quarter past 6 p.m. reached Teghab, which contains about twenty families of Arabs, with a considerable extent of rich corn-fields about it, fully ripe, from which part of the crop had been reaped, and was now undergoing the process of being trodden out and cleaned. As this process, however, was not yet completed, we had much difficulty in getting barley and straw for our cattle after a long contest. As the miserable villagers here are obliged to supply food and accommodation to every horseman and retainer gratis, a battle must always be fought, and sometimes violence used, before the hidden stores are forthcoming; and never having seen or heard of such a thing as a person travelling with a *fermán* from the Sháh, or an order from their chief, offering to pay for what is furnished to him, they believed the offer to be only a trick to induce them to show where their barley and straw were stowed, that we might help ourselves. Their excuse that the grain was not yet threshed out, was, as we afterwards found, merely a pretext. Their threshing apparatus consisted of a machine drawn by bullocks, and having a body like a sledge with two axles filled in below, furnished with flat pieces of wood or cogs about 3 inches long, by which the straw is chopped and broken up; the driver sitting on the machine to increase the weight. The water here is good; they have several cisterns and *kárizes* (under-drains). The property of the village consists chiefly in flocks. The night was cool and pleasant. Sun set at 115° W. (W.S.W. by S.)

14th.—We left Teghab at 2 A.M. soon after the moon had risen, and keeping over a bare, level plain S.E. by S. at 4h. 35m. reached Mohammed-ábád, and got good quarters in a mosque. Seeing some fish in the *kanát* (watercourse), which runs past the mosque, I rigged out a hook and line with needles softened in the fire, and in a little more than an hour caught upwards of thirty good-sized ones (one or two being nearly a foot in length), much to the astonishment of the natives, who had never even heard of their being thus caught and eaten, and asked how we cooked them, so that they could be eaten. Mohammed-ábád contains about 250 families when they are all brought together from the hills. They are all Arabs, and proprietors,* i.e. owners of herds and flocks, of camels, sheep, &c. The little cultivation they have, is chiefly cotton. At the end of the

summer, the water here is very salt; at present it is only a little brackish. In the afternoon, we had some heavy thunder squalls with threatening weather. We left Moḥammed-ābād at 2h. 20m. p.m., and proceeding S. by E. over a bare, flat plain, impregnated with saline matter, reached Chahak at 7h. 20m. p.m., and took up our place for the night on the roof of a deserted hut outside of the ruinous castle.* This place was at one time in a much more thriving condition than at present, as it is now in a great measure ruined; it has about fifty houses of one sort or other without and within the castle,† inhabited by Arabs. There is scarcely any cultivation about it; the water of the canal‡ is brackish. The night was very cloudy, close, and sultry, threatening rain.

15th.—I was delayed for more than an hour before starting, by the rest of the party who were not ready; but at length we set off at 3h. 15m. a.m., and kept S.E. along the plain, the hills to the left being about 4 miles off. At 4h. 40m. we passed a ruined reservoir,§ and from it, kept towards the point of junction of the two ranges of hills on the right and left. To the right, high up on the declivity, is the castle of Selānak.¶ In a range of red hills behind this, having the appearance of the earthy and saline formation common in this quarter, is found the *assa-fœtida* plant in considerable abundance. The whole plain here was covered with the withered stems, leaves and parsnip-like roots of the *kamah*, which has been dried up this year, owing to the failure of the rains, so completely that not a single green leaf of it is to be seen, nor has any of this season's growth thrown up a stem. The root of the *kamah*, which resembles the parsnip in appearance, but is much larger, is eaten. At 7 a.m., we reached the castle and village of Shu'shū', and got shady, but very hot quarters, in a small garden containing a few apple, apricot, and pomegranate trees. The apples were nearly ripe, and though without much taste or flavour, were tolerable in such a country: the very form of the fruits of one's native land is acceptable, and calls up many reminiscences, generally, however, painful ones. The crops here will not be ripe for ten or twelve days more. The apricots, although of a ripe colour, are small, hard and flavourless. Soon after my arrival, the chief of the village waited on me to request that I would prevent my people from entering and plundering the gardens. Shu'shū' contains about forty Arab families, and there is a good deal of cultivation. I procured from one of the villagers some of the dried leaves and stems of the *assa-fœtida* plant, which they use in decoction for various ailments, and in substance, as a medicinal condiment with their food. I

* Kāl'ah.

† Kāriz.

‡ Haurz.

§ Or Selūnak.

had not time to wait for an entire specimen of the plant, which grows in the neighbourhood in considerable abundance, but is by this time dry and withered. This season no *assa-foetida* gatherers (*anguzheh-chûn*) have come hither. They commence operations in the beginning of spring, searching out the plants which grow thick and bushy, but not above 8 inches or a foot high; they mark and cover them up with stones, to promote their growth and protect them from the heat. The root often attains the thickness of a man's leg, and before the plant begins to change colour, they slice it off with a thin layer of the root, and next day, or the day after, collect the inspissated juice which has exuded; repeating the operation six or seven times, till the roots are exhausted.* One man can attend to from 500 to 1000 plants.

In the afternoon, I sent Rejeb on to Bihrijân† with my *fermân*, and the *serdâr* of Turbat's letter to the amir, who is absent at a castle‡ named Khusb, 5 farsangs (19 miles) N.W. of Bihrijân, besieging the Nakhayah tribe, who, it seems, have thrown off his authority. I heard to-day from 'Alî Akber that about six years ago, Shîr Mohâmmad Khan Hazâreh came to Nokab, our halting-place a day or two ago, with 1500 horse, and carried off the entire population, men, women, and children. It seems that women are particularly valued by them; a man being worth about 15 or 20 *tómâns* (15*l.* or 20*l.*), a stout child or lad 20, and a good-looking young woman 40 or 50. Some time ago, a party of Merv Turkomâns arrived at a village in this neighbourhood, and riding boldly up to it, pretended that they were the retinue of Shâh-pasand Khân's uncle proceeding to Lâsh. They thus induced the unfortunate villagers to open their gates, and receive them hospitably, bringing carpets and pipes (*kaliyâns*) for the supposed Afghân chief, when they were unexpectedly seized and carried off.

We left Shu'shû' at 3h. 20m. P.M., and ascending the hills above it, kept a course generally S. over a succession of rocky hills of limestone and clay-slate, with many mastic (*lentisk*) and pistachio-trees growing on the declivities, and tamarisk brushwood in the hollows. Mastic§ is gathered from both the trees, which appeared to me to be the male and female *butûm* or turpentine-tree, the same as grows, but of smaller size, on the Sinjâr hills; however, 'Alî Akber insisted that one of the two was the pistachio-tree, and that it produces in alternate years

* The author had probably never seen Kœmpfer's excellent account of the plant, in the '*Amoenitates Exoticæ*,' Leingov., 1712, 4to. iii. 5, p. 334.

† Pronounced Bihrijân.

‡ Kal'ah.

§ It is probable that the pistachio and terebinth (*pistacia vera* and *terebinthus*) were the trees here seen: the mastic, as is well known, being the gum secreted by the lentisk (*pistacia lentiscus*), a smaller species of the same genus.

pistachios, and what he called a fruit, but which was evidently only a disease of the leaf common to both the trees; the sides of the leaves being reddened, thickened, and curled up; these are collected and used as a violet dye. We passed a scanty, brackish streamlet in a reedy hollow, and arrived at 6h. 30m. at a hamlet containing five or six houses, and a few tents surrounded by cultivation, and occupied by Arabs of the Káyin tribe. The *assa-fetida* grows in considerable quantities on some of the hills along the course of to-day's route, but I could find none of it near the road, and it was not advisable to venture to any great distance in search of it. At our halting-place, the inhabitants were busy with several huge cauldrons of ghorrat or inspissated butter-milk, reducing it to a solid form. On seeing the first of our horsemen make his appearance over the hill, one or two men who were in the fields ran for their lives to the huts, supposing him to be the scout of a party of Turkománs. The hills, the range of which we had crossed in to-day's march, had, some of them, a most grotesque and singular appearance, strongly resembling the mountains on the coast of the Persian Gulf about Hormuz, Gamrún, and Kishín; being high, sharp and peaked, twisted, bare and desolate-looking. It seems that it is in such places that the *assa-fetida* plant is generally found, especially where the soil is of a red, saline earth. We had lightning and a few drops of rain in the night.

16th.—We left the huts at 3h. 15m. A.M., and passed over a succession of steep, gravelly hills and deep ravines in a winding course, generally S.E. At 6 we got out from among the hills to the irregular border of the plain, and at ten minutes before 7 A.M. reached the city of Bhirján (Mihirján), and were met by a Ferrásh (chamberlain) of the amír, who conducted us to our quarters in the Ark (citadel).—This palace, or Saráí, was at one time commodious, and a tolerably handsome building, but is now in quite a ruinous state. All our party were accommodated within it in one way or other; and although there were apartments enough for four times our number, it was a matter of no small difficulty to find a few habitable ones, so encumbered were they with filth and rubbish. We had one great luxury and convenience here, viz., a large tank* of running water in the court, none of the purest it must be allowed, but still very useful. I was visited by the ákhún,† who is left to look after the city in the amír's absence. He made an offer of his services, and said that whatever we wanted should be furnished at the amír's expense; and though against my custom, I was here obliged to comply, in order to avoid giving offence. I gave the ákhún the

* Haúz.

† Preacher or orator; a Síkh or Afghán title.

Asef-ed-dauleh's letter to be forwarded to the amír's camp. I had a visit from the Móllá, who said he had accompanied Captain Conolly on the part of the Russian government, from Lásh eastwards. I was also visited by some merchants from Yezd and Kandahár, who have been already, as is always the case with Orientals, getting up all sorts of lies about the state of affairs at Kandahár and Herát, and endeavouring to join themselves to my party, or induce me to wait till they are ready to return. The Kandaháris said that they had been only fifteen days from that place, having come in thirteen; and brought a long lying story about the arrival of forty regiments there. Since Herát began to be in a disturbed state some years ago, many of the carpet-weavers emigrated from it to this place, and carpets of a good quality are now manufactured here, both by them and by the workmen of Bihriján. No carpets, however, that I have seen, are at all to be compared with those made by the Persians in the south of Persia, consisting entirely of wool. The Herát carpets have a cotton warp (or woof?), and are comparatively coarse. Bihriján is celebrated for its manufacture of felt carpets (*namads*), which, in workmanship and materials, far surpass those of any other place; and they sell accordingly at a comparatively high price. Here, indeed, they are scarcer and dearer than at Mesh-hed or Tehrán. The floor of my apartment was spread with some of these *namads*, said to be more than a hundred years old, as might be known by the patterns having been quite worn out on one side. They had been turned, and the other side new wrought. They looked new, and were about an inch thick. The heat at present is excessive, and has been greater for the last few days than for many years before; but this is an universal way of speaking both at home and abroad. To-day the thermometer at 3 p.m. in the shade was at 92°, the weather was cloudy, and there was a shower in the afternoon. I find I have caught a bad cold, probably at Khidri. In the evening I made myself better acquainted with some of the stars.

17th.—I had another visit from the merchants who came to me yesterday, along with several others who wished to accompany us on their return to Kandahár with laden camels; but, as we wish for no additional incumbrances, I gave them a positive refusal. In order to induce us to remain for some time here, that they might transact their business and join our party, they had spread a report that all our officers and troops have left Girishk, and that the road is shut up or unsafe. Their motives, however, being seen, and I having found that instead of 13 days, in which they said they had come from Kandahár, they had been on the road at least 18, and probably more, the falsehood of this report was the more likely. A man brought to me a few iron pyrites, very care-

fully wrapped up in paper. He said he had found them in the hills, and supposed them to be gold, or something equally precious: and he evidently did not believe me when I told him they were of no value. The credulity of the Persians and all orientals in regard to mines, treasures and talismans, is greater than was that of our own countrymen some 500 or 600 years ago. Saifúr Kulí Khán very gravely told me a long story of a móllá and zergár (goldsmith) at the Kóh Sengín (Sion Mount) near Mesh-hed, the latter of whom found a ruby of some pounds weight under his hand while asleep. The heat is still very great; the thermometer in the shade, at 3 P.M., being 94°. In the afternoon a messenger arrived from the amír's camp, with a letter from him addressed to me, in which he said that he regretted there had not been an opportunity of our meeting, but that he had given orders that whatever we required should be furnished by his people, and recommended me to proceed by the way of Furk, instead of Serbishah, as there were some horsemen of his at Furk, one of whom would accompany me as guide. I had a consultation with 'Alí Akber and others as to the best of the two roads; of which, that by Serbishah is the shortest and best; but as the amír had recommended the other, and I also wished to see his two strongest forts, Furk and Tabas, I decided on adopting the latter. The amír has now been for some time out against the Nakhíyah tribe at Kal'ah Khush, 5 farsangs (19 miles) from Bihrjand (Bihrján), with from 1500 to 2000 men, all the force he can muster; but he has not hitherto been able to do anything against them, though they number only about 300 fighting men. His operations have been limited to encamping at a distance from their fort, in the plain, without venturing to approach or attack it; carrying off what he can of the crop which is now ripe on the side nearest to his camp, without being able to prevent the besieged from coming out and securing that portion of it which lies nearest to the fort. I wanted to purchase some of the fine namads here, for which Bihrján is celebrated, but found that but few were procurable, and those dearer than at Tehrán or Mesh-hed. During the night I obtained a meridional altitude of Sirius.

18th.—I rode out this morning through the town and bázár. There is, however, hardly what can be regularly called a bázár; but in the quarter so named, there are many tolerably good shops, more in the European than in the oriental style; that is, they are not altogether open to the street, but the goods are placed in neat rooms inside, and protected from the heat and dust. Bihrján contains from 4000 to 5000 houses pretty well built of crude brick, three or four good caravanseráis,* and several good mosques

* Kárwánseráis.

and baths. It has no walls or defences, though the amír was desirous of erecting them; but he was prevented from doing so by the sháh. There are a few small gardens outside of the town, which produce little except jujube* and barberry† trees. The water of the canals (kanáts) which supply the place is very brackish.

The cookery of Bihriján is about the worst I have ever seen; strong and greasy: so fond do they seem of highly-seasoned food, that even the bread is thickly covered with shreds of onions and aromatic herbs; and all their dishes are full of pepper, grease, garlic and onions. As this was Friday (Jum'ah), I did not see the process of making the namáds, as the workshops were shut. I had a visit from a jerráh, or surgeon, who told me that he had practised for some time in Kandahár, Herát, and among the Házáreh's. He came to show me a ball-forceps that he had constructed for the purpose of extracting a ball which a patient of his had received in the thigh ten days before, and which, he said, had partly lodged in the bone. He had tried to extract it with levers, pincers, &c. without success. The instrument he had contrived was a rod armed at one end with three claws furnished with springs, so that it could be projected from a tube or drawn into it by means of a screw-handle. The idea was good; but the size and appearance of the instrument were enough to frighten any patient. He asked me many questions about our remedies for siphylis, and I gave him a little advice about the indiscriminate use of mercury. He showed me his case of instruments, many of which were curiosities in their way, and would astonish a London surgeon: among others, some brass and copper channelled probes, for drawing off the humours of the eye. The inhabitants of Bihriján are chiefly Persians and Shi'ahs, and have a very bad character for treachery, dishonesty and rapacity.

Having at length got ready for a move, and received an order from the amír's deputy, the ákhún, for accommodation and súrsát [suwarsá'at?] in the various villages on the route, I left Bihriján at 3h. 40m. P.M. under an excessively hot sun, amidst an assemblage of all the idle fellows in the place, of whom there were abundance, as it was Friday. Before we left our quarters, a man came to me with a paper, and read over a few names of Persian kháns, one of them designated as of Tálísh; he supposed that I knew them, and said that they had desired him to read or show the paper to any European or English officer who might probably be acquainted with their names.

We kept E.S.E. by S. in an excessively hot sun, at first close to

* Unáb.

† Ziríshk.

the base of the low hills which bound the plain to the left, and advanced by degrees more towards the centre of it, keeping in the direction of Buzhd:* we reached that place at 5h. 30m., and took up our station among some threshing-floors outside of the gardens. Buzhd is situate on the western base of a bare gravelly hill which forms the terminating point of a line of low hills projecting into the plain from the E.S.E. Below the village there is an extensive line of gardens, vineyards, and fields watered by a most copious clear stream from a *kanát*. The trees are chiefly jujubes† and mulberries:‡ wheat and barley are cultivated in considerable quantity; and some beet-root and cotton are also raised as well as turnips. The village contains about 200 families of sunnis. Almost the only article of manufacture is an open, thin, cotton cloth§ for shirts. This cloth, however, is produced of a better quality in the villages on the skirts of the hills. The distance of Buzhd from Barjand [Mihriján] is called 2 farsangs (7½ miles). Some people of Herát visited me here, and told the common story of their having been obliged to quit their native place by the tyranny of Yár Moḥammed. An old and very intelligent móllá here gave me a description of the caves or *dakhmehs*|| in a hill at Chemeshek, about 3 farsangs (11 miles) W.N.W. of Mudh, which I was very desirous of visiting; but I found that they lay too much out of my road. He said that on entering the first chamber (which, like the others, is cut out of the rock) by a doorway in the face of the hill, the bodies of three men are seen, in a half-sitting posture, against the wall in shrouds (*kufens*). The hair of their bodies is quite fresh, as well as what appear to be sword-wounds on their faces. From this chamber a gallery leads into another containing a tank of water, near which is the body of an old white-bearded man in a state of perfect preservation. From this several passages lead in different directions to chambers containing large heaps of bones, which can only be visited with lights, and which the people are afraid fully to explore.

19th.—We left Buzhd at 3h. 20m. in a cool morning, and kept through the upper part of the village, and round the shoulder of the hill, then in an easterly direction, over a hard gravelly plain, partly that of Barjand (Bihriján or Mihriján), and partly separated from it by the ridge of low gravelly hills at the W.N.W. end of which Buzhd is situated, which ridge runs out obliquely towards the centre of the plain. At 8h. 5m. A.M. we reached our station,¶

* Buzjd (in the MS.)

† 'Ummah and sinjed.

‡ Sháh-tút.

§ Táb-dár (i. e. warm).

|| Burial-places of the Gábres (Gaures or Jaures), who adhere to the doctrines of Zoroaster (Zerátusht), and are called by us, Parsis.

¶ Menzil.

the village of Isfizár, and got tolerable quarters in a garden. This place has a ruinous castle* on a hillock,† which, with a few houses outside, contains about twenty families, partly shí'ah,‡ and partly sunní.§ There are a few gardens and corn-fields around it; the latter are just changing colour. I prescribed for the ket-khodá,|| a poor, blind, paralytic man, whom the native physicians had nearly killed with pepper, ginger, opium and things of a similar nature which they had given him as remedies. He asked me whether the English wanted this country, and when they intended to take possession of it, saying that he and all his people were ready to receive us as deliverers. Isfizár has a good and sufficient supply of water from a canal.¶ We left Isfizár at 4h. 35m. P.M., and ascending gradually its narrow valley bounded by low, round, green hills, came to a small ruined fort on the right, and the remains of houses on the left called Terughdeh. From hence we kept ascending by a tortuous path among rugged shale rocks stratified perpendicularly, and twisted and jutting out in every direction. At half-past 6 P.M. we reached the highest point in the Pass, at which there is a very scanty spring of water. The descent on the other side was very steep and difficult, and the path much cut up by ravines and dry beds of torrents. After a very tedious ride, having taken every opening and successive line of round hills to be the Pass, and having proceeded for some time in the broad; gravelly, dry bed of a torrent, at 9h. 25m. P.M. we reached an abundant spring at the head of a fine valley filled with walnut, mulberry, and jujube** trees; and near the road a most magnificent nestereh or white rose-tree of great size hidden in snowy wreaths of blossoms near a fine plane†† tree. On the bare, rugged hills to the left, were the remains of a stone tower for the defence of the Pass, and in the hollow, two groups of Arab tents, near which we halted at 9h. 45m. The ruinous castle here, in the midst of a few gardens, is named Doshundeh.

20th.—Last night was cool and pleasant, and I slept soundly till the time of starting at 3h. 45m. A.M., when we left the tents and proceeded down the narrow valley S.E. by E. through a fertile and cultivated country with ripening crops till we came at 4h. 45m. A.M. in sight of the castle of Furk, and keeping the same course, reached our halting-place in a garden opposite to the village and castle, at 5h. 15m. The ná'yib showed the greatest alarm at the sight of thirty horsemen entering the village or approaching the gate of the fortress. This castle has the repu-

* Kal'ah. † Tepéh. ‡ Adherents of 'Alí.
 § Followers of 'Omar. || Deputy chief. ¶ Ká'ia.
 ** 'Unnib. †† Chinár.

tation of being the strongest place in Khorásán; and I have no doubt that the amír recommended this road on purpose that I might see that he has a place of such strength in his possession. In this country, where there is not a single gun to be found, and where a battering-train has never been heard of, it is no doubt a strong place; and the very idea of a stone fortress in a country where none but mud walls are to be seen, is of itself something. This castle is situate on a hill about 200 or 250 feet high, but it is commanded by hills to the N. and W. within cannon-shot (point blank); another hill to the southward, on the opposite side of the ravine, is about 1200 yards from the summit to the walls of the fort. The building itself is of an oblong square form with three tiers or ranges of building; the foundations and lower half of the walls and houses being of undressed stone and lime, and at the upper and inner parts partly hewn from the rock (limestone) on which it stands. The upper portions of the walls, houses, and battlements, are a mixture of stone, mud and crude brick, and in some places are of mud and crude brick only, which is already crumbling to pieces. At the angles of the walls there are round towers of stone and crude brick loopholed, as are also the outer walls; the whole, however, is clumsily and unskilfully built, and a few rounds of shot would probably bring down an entire side of the structure. The gateway is on the eastern side, partly covered by the houses of the village, but without other defences. Within the fort there are three large tanks, said to be sufficient for the supply of a large garrison for a year and a half: the water comes from a spring in one of the hills to the westward, and is conveyed to the fort by a covered aqueduct. A large store of corn is usually kept here; and the granaries can hold from 2400 to 2600 kharwárs* of 100 Káyin, or 50 Tabríz mans (each).* When the sháh was besieging Herát, 18,000 Káyin kharwárs are said to have been supplied to his army at once from Furk. Before the time of Mírzá Rafi' Khán of Der-mián, there was a ruinous stone tower on the hill surrounded by a few huts; but about thirty or thirty-five years ago (1806) he erected the present fortress, it is said, partly by the labours of Turkomán prisoners, and rendered himself by its means, with only a small district, richer and more powerful than Mir-'alem Khán, father of the present amír of Káyin. When Seifúr Kulí Khán visited it from Herát, about twenty-five years ago (1816), a short time after it had been built, there were only a few trees and one or two gardens in the valley beneath, though it is now quite full of them. Mírzá Rafi' Khán constantly resided in the fort, where he kept all his riches, not

* See note, p. 152.

admitting into it even his own sons; having, as an oriental, sufficient experience and examples that in such cases parricide is a crime too common. The care of the place was entrusted to his *názir* or steward, *Mírzá Ahmed*, in whom he placed the greatest confidence, and whom he loaded with favours. This man having been gained over by *Mír-'alem Khán* about fourteen years (1827) since, drew up a large party of the amír's men by ropes at the back of the castle during the night; and they, seizing *Mírzá Rafi' Khán* and most of his followers while asleep, put them to death, and remained masters of the fortress and the riches it contained: among other things, the pearl-adorned tent of *Nádir Sháh*. The *názir* met with the just reward of his villainy; for some time afterwards, on professing his devotion and attachment to the amír, and his fidelity to him, the amír asked him what salary and emoluments his former master, *Mírzá Rafi' Khán*, had allowed him annually: the unsuspecting traitor, in hopes that the amír would even increase what he had received, recapitulated all the riches and benefits which had been bestowed upon him. The amír, on this, said that the return for all this kindness had been the destruction of his benefactor and his family; he wondered that he had credulity or assurance enough to offer himself for any office of trust, or even to speak of such a thing as faithful service, ordered him to be driven from his presence, and his eyes to be put out; he still lives, old, blind and in great poverty, in the village of *Der-miyán*, all his wealth having been confiscated.

Furk der-miyán contains about two hundred families of sunnís, but has no manufactures except a little *kirbás*,* or coarse calico. The gardens furnish a considerable quantity of walnuts, and some of the trees from 30,000 to 40,000; but this year there has been a failure of the crop. The barberry (*zerishk*) is cultivated in large quantities, and the fruit exported to the eastward. They say that the crop is good only every second year. There is not a single gun in the castle, and only a few men; all the disposable force being with the amír at *Khusb*. I had a visit from the *Ketkhodá* or *Náyib*, and many female patients applying for remedies for their multifarious complaints, but especially for barrenness. They told me here, as they had done at *Birjand* (*Bihriján*), that an English *hakím* had come from that place about a year ago, and remained here several days, exploring the hills for minerals, &c. I took a hasty sketch of the fort in the forenoon, and in the afternoon ascended the hill to the southward, and had a good view of the fort, the village, and the surrounding country.

Our guide, *Ali Akber Beg*, was now generally known and wel-

* Or *karpás*: the carbasus of Pliny.

came in the different villages, whether from fear or liking, it would be difficult to say. A report was brought by the Náyib of an inroad* having been made a few days ago, and again yesterday, in the plain of Tabas, in the direction of our intended march, by a number of horsemen, variously stated at from 2000 to 10,000: and some of my party, who are ready to take alarm at everything, wished me to remain at Furk until the danger had passed by, without reflecting that, if the inroad had been really made, the danger was already past—at least from that party. I was much inclined to believe that this was the same report as that we heard at Nokab, which, after an interval of about a week, had travelled hither; the numbers of the enemy increasing with the distance.

We left Furk at 2h. 50m. p.m., without our promised guide, who was brought by Rejeb, with his hands tied, after we had gone some distance; which, had it been seen by any of the country people in the fields, they would certainly have accused us of man-stealing, as he was a poor old man. After we had gone about 4 miles I dismissed him with a present.

After a very tedious ride in a direction E. by S., we reached the castle† of Tabas at 7h. 30m. p.m., and were well received by Ahmed Khán, the commandant of the fort; but I preferred cool and airy quarters on a platform outside of the gate, to the confined and dusty huts within the walls. The sun set W.S.W by S.‡

The castle of Tabas is considered as a very strong place, and ranks next in importance in this respect, to Furk. It has a lofty mud-wall, glacis, and dry ditch, with a sort of drawbridge. The gate is defended by two massive mud-towers. Neither here, however, nor at Furk, is there a single gun. The greater part of the amir's horsemen and retainers is generally stationed in this place, under a trusty officer. The interior of the place exhibits a mass of filthy, ruinous mud-huts, huddled together in complete confusion, containing, it was said, about one hundred families. All the disposable men are now at the amir's camp. We had here more credible information of another inroad having been made, a few days ago, by a party of Hazáreh (Afghán) horse, in number about twenty-five, on some of the neighbouring villages in the plain. The inhabitants of Tabas are a mixture of I's and Persians.

21st.—I intended to have set out at daylight, but the horseman promised by the khán had not been sent overnight, nor a supply of barley, which it seems there was not much chance of our being able to obtain at our next halting-place, and which it was therefore necessary we should carry with us. The khán sent a mes-

* Chappáí.

† Ká'ah.

‡ More exactly 114½ W.

sage to say that he wished to visit me, if I would wait, but I could not afford to lose my day's march by so doing, and we accordingly set out at 4h. 10m. A.M., keeping a little out from the castle in the plain, with a N.N.W. course.

Before we left the place I rode out to look at some windmills near the fort, of a novel construction, at least to me; they were in full operation, as it was blowing a gale of wind from the N.W. There were two buildings, one containing eight, and the other ten, arranged in a semicircular form, each in a partition open on two sides; the breadth of the partition was filled up by an upright spindle, furnished with six vanes made of reeds; this spindle passes through an aperture in the roof, and turns the upper millstone, to which it is attached: the flour runs down into the apartment below. Tabas has several watercourses,* and abundance of good water.

At 4h. 30m. A.M. we had the ruined and deserted castle † of 'Alī-ābād, 1 mile to the right. It, as well as many others, has gone to decay since the murder of Mirzá Rafī Khān. A little further on, we saw a number of people running, as if for their lives, towards two small round towers in the fields near the road. On riding up to the towers in which they had taken refuge, and from which they were brandishing sundry swords and matchlocks, we found that they had taken us for a party of Turkomāns, or men-stealing Afghāns, an incursion ‡ having been made on a neighbouring village to the W. last night, and the chief's § son carried off.

At 5h. A.M. we reached the fortress || of Mohammed-ābād, built in a circular form, with lofty mud-walls, and containing about sixty houses, some within the walls and the rest without, forming a circle around it. On approaching it we could see the whole population in commotion, and the people from the fields, tents, and houses outside of the fort running helter-skelter to it, the tower of which, over the gate, was thronged with people, and in front of it a large body of men had turned out, armed with matchlocks and swords. Their fears and suspicions of us had been increased by seeing us come across the fields, and not by the regular path, and by our dress, as well as by the news they had received that an inroad had been made. Our Tabas horseman, in his Persian costume, having ridden ahead, waving his cap, quieted their apprehensions a little; and two horsemen, who had been ensconced behind the musketeers, ¶ dashed out to meet us, with a most superabundant display of courage, galloping and wheeling about, and brandishing their matchlocks. When they had once

* Kāriz.

† Kal'ah.
|| Kal'ah.

‡ Chappās.
¶ Tufenkchi.

§ Ketkhodā.

discovered who we were, old and young, men, women and children, turned out to receive us; and we could hardly believe that the place could have contained so many inhabitants. They brought us a *ḡaliyán** and a draught of sour milk.† When they heard that I was an Englishman they immediately began to accuse our government of being the cause of the late frequent inroads of the Afgháns, by the restoration of Ghóriyán to Sháh Kámrán. They say that the parties of Afgháns generally rendezvous at that place, or at least pass by it, both in coming and returning, and that the Hákim of Ghóriyán receives from them a tithe of the prisoners they make. I could not convince them, however, that—setting any other reasons aside—the time of harvest, when almost the whole population, especially the women and children, are in the fields, is the very season in which the men-stealers would be most likely to make their inroads. They said they begged and prayed that the English would come and take possession of their country, to deliver them from the tyranny and exactions of their own chiefs, and from the incursions of the Afgháns and Turkománs. The inhabitants of Mohámmad-ábád are chiefly I'ls.

From Mohámmad-ábád we kept a southerly course, and at 6h. 5m. reached the village and castle‡ of Destgird, containing about forty Pliyát families, with scarcely one man to be seen among them, most of the men having been carried off by the Turkománs, by the stratagem mentioned above, when the plunderers pretended to be the retinue of the uncle of Sháh-pasand, khán of Lásh, proceeding to Mesh-hed. Many of the villages in this plain are in such extreme poverty, on account of the inroads of the Afgháns and Turkománs, that their wretched inhabitants have bread to eat only for about three or four months of the year, subsisting for the remaining eight or nine months on turnips, beet, or such food, although the soil, when cultivated, yields luxuriant crops of grain. The fúlgehs about the Nakhiyah *Ḳal'ah* of Khush to the W. of Barjand (*Bihriján*), and those in the plain of *Ṭabas*, are the granaries of the amír's country, and without them the population could not exist; yet not a twentieth, nor even a fiftieth, part of the plain of *Ṭabas* is tilled, though it might be brought under cultivation from the one range of hills to the other.

Destgird is inhabited by I'ls, and there were a good many of their black tents outside of the castle.‡ From hence we kept a course S.E. by S. $\frac{1}{2}$ S.,|| through rich *dáyimeh* wheat-fields, in which they were reaping the ripe corn with most clumsy sickles.

* The Persian pipe, in which the smoke is made to pass through water.

† *Dúgh*.

‡ *Ḳal'ah*.

|| 150° E.

On seeing us approach, about a hundred men, women, and children, who were busy in the fields, collected in a body, the men with their matchlocks some way in advance; but when they found who we were, they received us joyfully. They repeated the same story about the surrender of Ghóriyán's being the cause of the inroads,* and said that three of their people had been carried off the night before by a party of seventeen Afghán horsemen. They knew 'Alí Akber, our guide, who, when on his way to Mesh-hed, had told them that our army was coming in this direction; they now surrounded him, asking why they had not come, and when they were to expect them.

The whole plain, to about 2 miles S. of Destgird, its southern limit, has at one time been under cultivation, and the quantity of corn that might be raised from it is enormous. They never allow the land they are in the habit of tilling, or that near the forts,† to lie fallow, but spread on it, every two or three years, a small quantity of the earth of old mud-walls, salt, ashes, or pigeons' dung. All over the plain there are, thinly scattered, rounded pieces of vesicular lava, which appear to have come from some low, dark, rocky hills, between the higher limestone ranges at its south-eastern corner.

At 6h. 30m. A.M., having gradually ascended for about 10m., we got among low hills, where the path divides, leading, one way to Derah or Derahí, through the hills to the left, without either villages or water, and the other by Rúzah, which we followed, to the S.E.‡ At 7h. 10m. A.M. we reached the top of a rugged and difficult, rocky pass, the path winding among huge blocks of obsidian, of which the lower hills entirely consist. At 7h. 40m., after a rugged descent, we kept E. At 7h. 50m. we reached a narrow valley, filled with torrent-worn, earthy mounds, covered with a saline efflorescence; and there were in front of us, two remarkable rocky hills, rising up, bare and perpendicular, to a height of about 250 feet. At the base of the southern one, there were a few gardens, a burying-ground,§ and a small castle.||

At 8h. 5m. A.M. we reached the castle|| and village of Rúzah;¶ the whole population being collected on the walls, expecting us as enemies. They mustered a considerable body of matchlockmen, several of whom fired off their pieces at us; one of their bullets striking the ground a few yards in advance of us. When once, however, they discovered who we were, we met with a more hospitable reception, and, getting good quarters in a garden, passed the day pleasantly under the shade of some fine mulberry-

* Chappáó.

† Kál'ab.

‡ 135° E.

§ Mazár.

|| Kál'ab.

¶ Or Rauzah, i. e. garden.

trees, the heat being tempered by a strong north-westerly breeze. The red and white mulberries, apricots, &c. were ripe, and the crop cut, but the grapes require another month or six weeks to bring them to maturity.

Rúzah has many good houses, but is almost deserted, not numbering more than twenty families of I'liyáts. It is surrounded by gardens, vineyards, and a good deal of cultivation. Most of the Persian I's, at least those in the eastern part of the kingdom, acknowledged the father of the present amír of Káyin, Mír-'álem Khán, as their chief.

Our rate of travelling to-day was about $3\frac{1}{2}$ miles per hour. We are now beyond the limits of the Turkomán forays; at least they rarely come beyond the pass between this and the plain of Tabas. I had a visit from one of the villagers, whose brother, one of the amír's chief men, is at the camp at Khusb. He was deaf and dumb, and amused me much by his inquiries and gestures. Another of the villagers acted as interpreter. He asked why we did not come and take the country, and put out Yár Mohammed's eyes?—a punishment which to him, already deprived of speech and hearing, must appear worse than death itself. He indicated Yár Mohammed by twirling his hand about his head, as if tracing the folds of a shawl-turban, and pointing to his side, as to a sword. The Kájárs* and Mohammed Sháh he designated by putting on a look of great consequence and twirling his mustachios; and Ahmed Khán, the governor of Tabas, who is a stout man, by placing his open hands on either side of his belly and blowing himself out like the frog in the fable.

As our next march was a long one, said to be 7 Káyin farsakhs,† we left Rúzah at 11h. 45m. P.M., and kept a S.E. by E. course over rocky and broken ground.

At 4h. 35m. on Tuesday the 22nd of June we came to a cultivated spot in a narrow valley, with some corn-fields and a few fine trees of the large black mulberry, or sháh-tút, just ripe. We mounted the large one in the road, which appeared to be public property, and feasted for nearly an hour, much to the disfigurement of our hands, visages and clothes. This spot belongs to the Kal'eh Makhánek, in advance of us, which we reached at 6h. 10m. This small castle was hidden behind some low hills to the right of the road, so that unless we had been told of it by the guide we should not have been aware of its existence, and had not the people taken alarm at our party, and shut themselves up within their mud walls, discharging a few matchlocks now and then to inspire us with a wholesome dread. They had left out two or

* King's tribe.

† The Arabic form of the Persian word "farsang."

three men, so old and decrepit as to run no danger of being carried off by men-stealers, to answer questions and to watch our motions; but they were either stupified with terror, or pretended to be so, so that we could not get an intelligible reply from them. As my people wished to halt here, instead of going on to Derah at once, I rode up to the top of the hill near the castle,* and endeavoured to parley with its occupants; but as they would listen to nothing, and as neither I nor Rejeb wished to be any longer a mark for their shot, several of which they had fired at us, nor to end our lives thus ingloriously, we decided on retreating, and again moved onwards at 6h. 25m. in a general course of S. by E. $\frac{1}{2}$ S. The water-course† and pool on the road side were surrounded by fine jujube‡ trees, with a very tempting shade. The villagers here had some sufficient reason for their fears and precautions, as since the time that 'Alí Akber passed, about six weeks ago, five of them had been carried off by the Afgháns; and one of the old men said that no less than sixteen from their village were in slavery at Bokhárá, or in its neighbourhood. At 6h. 50m., our course being S.S.E. $\frac{1}{2}$ S., we got into the broad, dry bed of another torrent,§ overgrown with tamarisks and brushwood, and bordered by rugged limestone cliffs, with a few mastic trees|| at intervals, showing their decayed trunks in the clefts of the rocks; their scathed and stunted appearance, and the blackened snake-like roots and stems of the tamarisks, giving the scene a singularly wild and savage appearance, to which the dry and arid appearance of these fantastic hills, and the total absence of animal life, gave double force. After emerging from this narrow ravine, the road crossed some more open but still very uneven ground, with ranges of hills apparently volcanic to the right, about half a mile off, and successive lines of high, sharp and precipitous limestone hills 2 miles and a half distant on the left, and stretching out far away to the eastward. Over the low ground there were scattered many large rounded blocks of vesicular lava. The plain beyond the point of a low range of hills to the right, opened out wide to the southward and westward. At a quarter past 9, on turning round a bare limestone hill to the right, we saw Derah bearing S.E. by S. $\frac{1}{2}$ S., and keeping along the edge of the dry and stony plain about 1 mile from the hills, but gradually approaching them, we reached our halting-place at a quarter past 10 a.m., and were well received in the absence of the chief, Mohámmad Rizá Kálanter,¶ by his brother, Khwájah** 'Abbás, and accommodated with as

* Kál'ah. † Káriz.

‡ 'Unná. § Rúd-khánah, i. e. river house.

|| *Lentiscus*—*Pistacia Lentiscus*, Lin. ¶ Or Kálander.

** Pronounced khájá, or khojá.

good quarters as the place could furnish in another brother's house.

The chief here owes a nominal allegiance to the amír of Káyin, and has at present 100 of his men in the amír's camp at Khush; but Sháh-pasand Khán also claims allegiance from him, on the other side, and has 50 of his men at Juweín.* He very naturally wishes to be independent of both, and made many protestations of his desire to serve our government, especially should our forces march against Herát, as he expressed the most bitter hatred of Yár Mohammed. Sháh-pasand Khán and his family had been his guests here for about six months, when threatened by Sháh Kámran. From the poverty and ruinous state of the village, they have no horsemen, but he said that if he had money to pay the expense of clearing out an old water-course† in the plain, it would enable him to keep at least 20, or a number sufficient to guard the passes to the plain of Tabas.

Derah, or Derahí as it is generally called, contains about 250 families of Persian shí'ahs, and can furnish 300 of the most hardy, active, and brave foot soldiers in the country. The village is situated on the southern base of a bare limestone hill, surmounted by a ruinous fort, with a few gardens and corn-fields; but its chief produce, though but scanty, is cotton and turnips, which last are its chief article of food for many months. To it is attached the small village of Lámu, about 2 farsangs (7 miles) to the E.N.E. Nothing is manufactured here but a little coarse calico.‡ The chief complains that his people have nothing to do, and, as is generally the case under such circumstances, they are miserably poor, and bear a bad character for dishonesty. There is great abundance of large game in the neighbourhood, especially of the wild asses.§ *Assa-fetida* grows in considerable quantities both on the hills and in the plain. In the forenoon 'Alí Akber sent off a courier|| to Lásh, to apprise Sháh-pasand Khán of my coming. The messenger engaged to perform the journey between noon and nine o'clock the next morning, being at least 22 farsakhs¶ (or 88 miles) with water at only three places.

23rd.—I passed the night on the roof very uncomfortably, owing to a furious gale from the N.W. I intended to have set off in the evening, but as many of the cattle were knocked up, I complied with the wishes of the party to give them another day's rest before we ventured on the desert. After breakfast, I visited the

* Joneen in Arrowsmith's Map of Central Asia (1834).

† Káriz.

‡ Kírbáz.

§ Gúrkhar.

|| Kásid.

¶ Farsakh is Arabic, and Farsang (whence Parasaunga) Persian: he engaged to travel upwards of 88 miles in 21 hours—above 4 miles per hour.

old castle* on the hill top, over the village, but found it a mere ruinous heap of stones and mud; and it has never been either large or strong. The road to Serbishah, 12 farsangs (45 miles) distant, bore from it W., and two black mounds† in the plain, distant 2 miles S.W. There is a lofty steep round-topped mountain, with a ruined fort on it, called Kal'ah Síband, E.S.E. about 12 miles off the opening in the hills, by which the road leads to Khurmáki S.S.E. $\frac{1}{2}$ S.

In the plain, which is longest from W. to S.E., there are one or two spots that have water, but no villages. The furious westerly gale still continues. Thermometer in the shade at 3 P.M. 90° Fahrenheit.

24th (Nativity of St. John the Baptist).—The violent gale still continues. Intelligence was brought of some men having been seen lurking about in the desert by the Shikáris‡ from this place; and last night a plundering party of Belúches mounted, as they always are, on camels, passed close to the gardens, and sent one of their party to procure bread. The Belúches never take men, but carry off whatever cattle they can lay their hands on, from a sheep to a camel. Their number amounted to 15.

Khwájah 'Abbás accounted for the greater frequency of inroads§ since the surrender of Ghóriyán, by saying, that the usual and most direct road of the plundering Hazárehs (Afgháns) lies through that place. He stated the price of a stout child, man, and woman to be respectively about 20, 15, and 40 khorásání tó máns (27*l.*, 19*l.*, and 54*l.*). I learned that Baron Boré had gone and returned by this route and by Lásh to Kandahár, when the sháh was besieging Herát, charged with 8000 tó máns (11,000*l.*) from the sháh to the serdárs (commanders or chiefs). He had not failed to magnify the power of his own country and depreciate ours by every representation possible. He remained only one day at Lásh.

Having got, as a guide, a stout, one-eyed shikári, named 'Alí Kadáng, celebrated as a pedestrian, with his large balls of calves stuck up under his hams, and his long legs wrapped round with cotton rollers, we left Derah at half-past 2 P.M., and having, at 20 minutes past 5, reached a small well of good water, we halted 25 minutes to water our cattle, this being the only well or spring in our journey. After crossing a marshy waste generally covered with a saline crust, and containing many pools of brackish water bordered by reeds, with a course generally S.E., at half-past 6 we proceeded by a path winding among rocky hills. We now moved along quietly, with every precaution to prevent surprise or

* Kal'ah. † Tepehs—mounds, or tumuli. ‡ Hunters. § Chappáó.

confusion, in case we should encounter a party of Belúches, an event by no means improbable, as there are several grassy hollows in the neighbourhood, where they are in the habit of halting. We intended to have remained till day-light at a small spring to the right of our path, about 2 farsangs (7 miles) from Khurmáki, but, as we found it dried up, we went on, till at 11 P.M., having a remarkable conical hill about 1 mile to our left, we halted in a patch of sandy ground covered with long coarse grass and tamarisks, to wait the return of daylight. It was probable that, if the Belúches or Afgháns were out, we should find them at this spring; and it was better that we should meet them in the day than in the night, for, as the saying is, "in the desert no man meets a friend." The northerly gale, which has been blowing for some days, still continues. We got a few hours' disturbed sleep, and our cattle a mouthful of food, though nearly overwhelmed with sand and dust.

25th.—We left our uncomfortable quarters when daylight appeared at a quarter past 3 A.M., and kept a S.S.E. course along the dry sandy bed of a torrent, gradually turning to N.W. round the end of the rugged range of limestone hills, one of which is the conical hill already mentioned, and thence over dry, rocky ground, which by its appearance, gave no indication of the vicinity of water. At 20 minutes past 4 A.M. we reached the scanty spring of Khurmáki at the foot of a precipitous limestone hill. This spring is so named from a single date-tree,* apparently a female, which grows close to it, and indicates a tropical climate, being the first I had seen since I left Baghdád, now nearly a year ago, except some young ones in the botanical garden at Edinburgh. Though no stream at present flows from this spring, there is abundance of water, which soon returns after the hollow receiving it has been emptied. The water, though hard, is good. There is much large game hereabouts, such as the antelope and wild ass,† as was manifest from their recent tracks about the spring. In the same chain of hills, about 1 farsang (4 miles) to the north, there is another scanty spring of fresh water, and a copious saline one with abundance of grass and reeds; the name of the place is Ghurghuri. From the precipice overhanging the spring, the conical hill above-mentioned, with a pointed shingly summit, bears 95° W. (W. $\frac{1}{2}$ W. by S.), distant half a mile, and it is a good landmark for the well, especially from the eastward. On its western side there is another very scanty spring of fresh water, with a single date-tree. The centre of the Kóh Atesháneh bore 85° E. (E. by N. $\frac{1}{2}$ E.), distant about 10 miles. On its northern end there are two large streaks or beds of white sand, which is used by the in-

* Khurmá.

† Gur-khar.

habitants of Kalákah (?) for softening and cleansing their woollen cloths. The distance from Derahí to this place is called 6 farsangs (20 miles), but it is at least 9 farsangs (31 miles). I found a shady cave in the face of the hill, and took up my abode in it when the day got hot, and passed the afternoon very pleasantly. 'Alí Akber's man went to sleep, and allowed his horse and pony* to stray into the desert among the low hills, and several horsemen had to search for them an hour or two before they were found.

We left Khurmáki at 5 minutes before 5 P.M., and, retracing our steps for a short distance, reached the dry bed of the stream† in a quarter of an hour, and crossed a gravelly plain with a course 95° E. (E. $\frac{1}{2}$ E. by S.). At about 6 P.M. we saw a herd of wild asses‡ half a mile to the right, and rode in that direction to get a shot at them; but they were too shy to let me get within range, though I was near enough to have a good view of them. The herd consisted of about thirty old and one or two young ones. I galloped some way after them in expectation that the foals would fall behind, but the little fellows kept ahead of all. There was another large herd also, close to the right of our path; and the plain, they say, is here sometimes covered with them. Among the herds of wild asses, horses, which have escaped and become wild, are occasionally seen.

This plain is quite level, hard, and bare, exhibiting many rounded pieces of lava and jasper, with a scanty sprinkling of the usual dry, thorny, and aromatic shrubs of the desert, bent down and nearly uprooted by the furious gales that sweep over its surface. The tracks which lead over it are very indistinct, and further to the S.W. there are no land-marks to guide a traveller unaccustomed to traverse the desert. Seifúr Kulí Khán was travelling many years ago from Lásh to Bírjand (Bihjáñ), in company with some merchants, Uzbegs, Turkománs, and Hindús, when one of the latter lagged behind and was never again heard of, though every possible search was made, and a man well acquainted with the desert sent from Derah to look for him. The unfortunate man had with him a few water-melons and some bread, which would only serve to prolong his sufferings. His bones are, in all probability, whitening in the desert. The appearance of the high land we had left over Khurmáki is very remarkable, and cannot be mistaken: a high though not extensive table-land, with a pointed conical hill at its southern extremity, and a mammillary hill a little higher at its northern end.

At 9 o'clock P.M. we had the end of the Kóh Atesháneh (fiery mount) 2 miles to the left. It is so called from the extreme heat

* Yábú [a Hindí word].

† Rúd-kháneh.

‡ Gúr-khar.

and aridity of its neighbourhood; and we were fortunate in having the strong northerly gale still blowing, without which the heat would have been insupportable. After crossing broken, clayey, saline ground, covered with tamarisks, with an easterly course at the rate of 3 miles per hour, we reached our halting-place in the bed of the Herút (Herí Rúd), and went to sleep among the sand in a tamarisk-bush at 25 minutes past 12 in the morning of Saturday the 26th of June, 1841.

This place is said to be 7 farsangs (25 miles) from Khurmákí, but is in reality about 8 (29 miles). From the hill above the spring at Khurmákí, the Deryái Hámú,* I learned from our guide, 'Alí Kadáng, that the flesh of the wild ass† is dried and cured for winter-use, and its fat is considered as a great delicacy. As much as 3 Tabríz mans‡ (21½ lb.) are sometimes yielded by one carcase. Their hides sell for a good profit at Bihjáñ and Mesh-hed. The donkey which our guide had brought with him to carry a load of bread, onions, &c., and occasionally to mount his weighty carcase on, fell sick, and would neither eat, drink, nor walk. Bleeding and the cold effusion which I tried were of no use, so he was left behind for the wolves. A camel, that had been in like manner left behind at the Herí Rúd, and was supposed to have died, got so fat and savage among the abundance of grass and water, that when he was found again by his owners some months afterwards, they could not catch him, and he attacked his pursuers, biting and kicking them with great fury, so that he seriously wounded several of them, and was at last shot for the sake of his flesh.

The Herí Rúd§ river, in the bed of which we had taken up our quarters, is a continuation of the Adraskand, which rises about 13 farsangs (48 miles) S. of Herát, and when full, in the early part of spring, is large and not fordable without a guide. It now, however, is reduced to a chain of pools filled with stagnant though tolerably good water. It falls singly into the Deryái Hámú. There are some large pools of salt water and saline marshes near its bed, which is thickly bordered by dense tamarisk underwood and reeds, reminding me (as I looked out upon it from a sort of cave in its hard shingly bank, in which I had taken shelter from the burning sun) of the banks of the Tigris between Başrah and Baghdád. My habitation was not very comfortable, as the thermometer in the afternoon rose in it to 110°, and everything we had, our clothes, baggage, mouths, eyes, and food, were filled

* Properly Deryái Hámún, the sea of the desert, i. e. the lake Zartah, or Dharrah.

† Gúr-khar.

‡ 1 Tabríz man = 600 miskáls, or 7½ lbs.; and 1 Kandaharí and Sistáñí man = 800 miskáls; 1 káiyíní man = 400 miskáls.

§ Pronounced Herút. Herí-rúd signifies Herát river.

with the sand and dust raised by the furious wind. One of my servants saw a large fish in one of the small muddy pools; we immediately set to work, and caught about a dozen with a turban-cloth, weighing from 1 to 4 lbs. each; but they were all, as we say of the salmon in Scotland, foul. They were divided among the party, who discussed them with great relish. Early in the forenoon two horsemen arrived from Lásh, having been sent on by Sháh-pasand Khán the evening before, with a present of a basket of grapes and cucumbers, and orders to conduct us to the castle.* The courier† sent from Derah had reached Lásh in about 28 hours, but would have done it in 12 or 14 had he not hurt his foot.

From the Heri Rúd the centre table-hill of Khurmáki bore 103° W. (W. by S. $\frac{1}{2}$ W.S.W.), the extremity of Kóh Atesháneh 106° W. (W. by S. $\frac{2}{3}$ W.S.W.), and its centre 120° W. (nearly S.W. by W.).

[Thus ends abruptly the journal of this highly-gifted and enterprising traveller, the sad termination of whose exertions for the advancement of geographical knowledge was announced by the President of this Society at its anniversary meeting on the 23rd of May, 1842 ('Journal of the Royal Geographical Society,' vol. xii. pp. xxxix., lxx.). As the reader of the above narrative cannot but desire to learn every particular respecting the remainder of Dr. Forbes's journey, a copy of the deposition made at Kandahár by his confidential servant, who had been strongly recommended to him by a gentleman attached to the mission in Persia, is here subjoined.]

Copy.—Deposition of a Persian servant who accompanied the late Dr. Forbes to Sístán, and was present at the time of that officer's murder.

At Lásh, Sháh-pasand Khán made use of every possible argument and entreaty to dissuade Doctor Forbes from prosecuting his journey to Sístán, representing to him that the roads were unsafe, and that, at the present season, it was particularly dangerous for a British officer to place himself in the power of the Belúches; but the Doctor would not be convinced; and to free himself from the importunities of the Khán, he gave him a sealed paper, exonerating him from all responsibility, should any thing unfortunate occur in the course of the journey. "I only require your guarantee," said the Doctor, "as far as the Sístán frontier; beyond that, let the risk be on my own head." Six days were taken up in

* Kál'ah.

† Kásid.

these discussions, at the expiration of which the Doctor hired three camels, and set off on his journey. We halted the first day at a village dependent upon Lásh, and the Mihmándár,* whom Sháh-pasand Khán had sent to escort him to the frontier, paid him every attention, and procured him whatever he required. In the morning Sháh-pasand's man made a last attempt to induce Doctor Forbes to change his mind regarding the Sistán journey; but he failed, and, on the frontier, took his leave, and returned to Lásh.

On the third day from this we reached Chiling,† where Mohámmad Rizá Khán, the chief of Sistán, resided. Here we were most hospitably entertained, and remained three days, the Doctor taking notes from Mohámmad Rizá Khán of all the tribes, forts, ruins, &c., in the province, and entering the same in his journal. This was the general practice of the Doctor throughout the journey; and I frequently remarked that the chiefs appeared to dislike answering his questions, and replied to his inquiries by asking his object in seeking such information. My master used, as he travelled along the road, to note carefully all the distances, which he put down in his tablets. He also inquired the name of every fort and village that we saw, and he was constantly using a compass, and sometimes a larger instrument, which he called an astrolabe. He also sometimes made sketches and plans of the different forts, and showed them to the kháns who inhabited them, at which they did not always seem well pleased. None of the people with whom we servants associated appeared to understand what could be the object of the Doctor's travelling; some said he was an engineer, others a magician, but most people, I think, looked on him as a spy. He always said himself, when asked, that his object was merely siyáhat (travelling for amusement), or on a pilgrimage; but it was not believed that any one would come at such a season into Sistán for the mere pleasure of looking at old mounds; and his visit was, I think, generally supposed to be connected with the state of political affairs, and with the probable advance of British troops against Herát.

Mohámmad Rizá Khán did not, however, in his personal intercourse with the Doctor, show any signs of suspicion, or treat him in any way with discourtesy. After remaining three days at Chiling the Doctor asked for a guide to take him to the Kúhi-khwájah in the lake of Sistán,‡ and the Khán immediately appointed a suitable escort. We crossed the lake to the island, and spent a day very agreeably in this excursion, after which we again returned to Chiling, and passed another night there as the guests of Mohámmad Rizá Khán. On the morrow, the Khán sent an escort with us to his other fort of Síkóhá, appointing a mihmándár to attend upon the Doctor. We remained there three days, and were treated most hospitably; Dr. Forbes employing himself in sketching the fort and collecting information regarding the surrounding country.

From Síkóhá we went on to Dashtak, the fort of Mohámmad Hashám

* Protector.

† This and other names are doubtful.

‡ The lake Zerreh, also called Deryái Hámmún, i. e. sea of the desert.—F. S.

Khán; and our sojourn there was protracted to five days. On the day of our arrival there was some confusion in the place, owing to the death of the Khán's son; but afterwards, the Doctor was treated with the same attention and respect that he had experienced at Chiling.

The Doctor made excursions from Dashtak to several places in the neighbourhood, but we did not accompany him. The servants and people of Hashám Khán were constantly asking us why the English gentleman had come into Sistán, and what the English were going to be about in Herát. They seemed generally to think Dr. Forbes must be visiting the different Sistán chiefs, to associate them in a league against Yár Mohammed; but I heard it sometimes surmised that the English intended to join Sistán to Kandahár, without reference to Herát. After this we went on travelling without any thing particular happening to us. We went to Husein-ábád, and remained there one day; then to Bunjar,* where we halted two days: then we returned, and passed another day at Bunjar, and then we went on to Burji,* where we were hospitably received by the chief, Dóet Mohammed Khán. We remained there four days, two at Burji-khna,* and two at Burji; and then travelled on by 'Ali-ábád and Shading,* to Jehán-ábád, the seat of Ibráhim Khán, Belúchí. On our arrival Ibráhim Khán was absent, having gone out as usual to hunt, but in the evening he returned, and did the honours of his house in a rough but sufficiently friendly way. We remained four days at Jehán-ábád, and I heard many things spoken among the people, which gave me alarm. They said the English always sent about spies before they attacked a country. A man calling himself a traveller had visited Kelát, and shortly afterwards an English army crossed the Indus, and on its return slaughtered Mihráb Khán, and the Belúches. Was the same fate, they asked, to be expected by the Sistánis?

I mentioned their remarks to the Doctor, but he laughed, and said Ibráhim Khán was his best friend. The Doctor amused himself at Jehán-ábád by making a drawing of the fort; and this he showed to the Khán, who seemed outwardly pleased at it; but I heard his people saying that the other traveller had in the same way taken a plan of the Fort of Kelát, and that to that plan Mihráb Khán owed his ruin. There was no reason, however, to suppose that Ibráhim Khán himself harboured any evil intentions. After a four days' residence at Jehán-ábád, the Khán, with a party of horse, accompanied us to Nadalo,* and entertained the Doctor there for two days in a hospitable manner. This was the extremity of Sistán; and Dr. Forbes, having thus travelled through the entire province in safety, wished to return to Lash, and prosecute his journey to Kandahár. He applied to Ibráhim Khán, accordingly, for a guard; but the Khán said he would himself escort him to the frontier, and from thence send on a party of horse to take him to Sháhpasand's fort.

We all started accordingly in company the next morning. The Khán, I thought, seemed reserved; and, after we had gone a short way, I remarked that he lagged behind, and, looking round, I saw that he and

* A doubtful name.

his people were loading their guns. I immediately passed on, and told the Doctor, who turned pale, and said the fatal day was come: the Khán, however, soon rejoined him, and they entered as usual into friendly conversation. The Doctor asked Ibráhim Khán why he and his people had loaded their guns, saying, he supposed there were no enemies lurking about, and the Khán replied that he always hunted as he journeyed along, and, on reaching the river, they would find plenty of wild boars. Soon afterwards we arrived on the bank of the river. It was a place, I understood, where horsemen usually ford, being near a well-known tomb, called Kherágah Gurgi;* but the bed was very full from bank to bank, owing, as I subsequently learned, to the Khán's having sent on beforehand, and broken the *bunds* (dams), which usually turned off the water. The Doctor asked Ibráhim Khán how he was to cross, and the Khán immediately told his people to make a *tútan*, or raft, made of reeds, capable of bearing one man. When this was completed the Doctor was directed to strip, and get upon the raft, which was then pushed off into the stream, the Doctor having a long stick in his hands, with which he was to push himself across; his arms, clothes, instruments, and other property remained upon the bank, under the charge of myself and my fellow-servant Kerbelahí Taraz.* He had not pushed the raft above fifteen or twenty yards into the sluggish stream, when Ibráhim Khán, who was standing composedly on the bank, levelled his gun and fired. The ball did not take effect, and the Doctor turned round and asked who fired, and why; the Khán answered that he had shot at a water-fowl, which had dived. The Doctor seemed to believe him, and went on pushing. He had proceeded a very short distance further, however, when Ibráhim took another gun from one of his people, and fired a second time with deliberate aim. This time the shot took effect, and I saw the blood flowing from a wound in the Doctor's right side, which was exposed to us. He immediately fell off the raft into the water, which, I was surprised to see, did not reach above his middle, and began to wade back to the bank that he had left. Ibráhim Khán now commenced abusing him, calling him a *káfir*, a spy, a dog, and all manner of opprobrious names. The Doctor cried out, Do not kill me; take all my property, but spare my life. What can you gain by killing me? I am but one man, and have never injured you. My countrymen are many, and will take vengeance for my blood: do not make all Englishmen your inveterate enemies.

It was all, however, of no avail: the Khán continued to pour forth abuse, and on his victim's reaching the bank, drew his sword and struck him a blow on the head, which felled him to the ground. I saw the Doctor lift up his hands, as if in prayer, but he was almost immediately killed by some sword-cuts from the Khán and his attendants; and his body was thrown into the river. While this was going on Kerbelahí Taraz* and myself were seized and bound. A general plunder of the Doctor's property then commenced: the books and papers were the first things seized; the greater part were torn up and destroyed upon

* A doubtful name.

the spot, but the Khán took two small note-books, and said he would keep them for himself. The compass, the astrolabe and other things which the Belúches had seen the Doctor use upon the roads, were then beaten to pieces, and thrown into the river. The Khán seized the Doctor's arms for himself, and let his people divide the remainder of the property among them. After this we were carried, bound and watched, to Kaddeh,* and were present there when that district was harried. The Khán subsequently sent us to be confined in his fort at Jehán-ábád. We were repeatedly led out to be killed, but were saved by Kerbelahí Taraz* repeating verses of the Korán, and assuming the character of a móllá. After about a month's confinement I was told I might travel back to my native country, at Jemáín,† but that if I attempted to go to Kandahár, I should be assuredly overtaken and murdered.

On leaving Sistán I fell in with a káfilah (caravan), and arrived here under its convoy. I do not think Kerbelahí Taraz* is now in any danger of his life. He is a good Arabic scholar, and has established a reputation for sanctity; so that he is now surrounded by a crowd all day begging for amulets, prayers, &c. Ibráhim Khán and his people used to express great satisfaction at having slain the feringí, and thus saved Sistán from the danger which threatened it from his visit.

Deposition taken before me at Kandahár, 25th September, 1841.

(Signed)

W. RAWLINSON,
Pol. Agent.

* A doubtful name.

† Jemáín †

'ROUTE FROM MESH-BED TO THE HERI RŪD.

Date.	Place.	Time.	Direction.	General Remarks.
June 2.	Mesh-bed.	h. m.	S.E. by E.	Nearly opposite, 2 miles to the right, in a small glen, 'Abbās Mirzā's garden, called Takbī Kāfūr.
— 3.	'Askariyeh	" "	S.E. by S.	Kadamyāh road.
— 4.	" "	1 45 A.M.	" "	Halt.
	Robāpī Miyāndeshī	2 30	S.W. by W.	Uneven declivity.
		0 35	" "	Nearly level pastures.
		3 35	" "	Kāfūr-kāl'ah, on a hill $\frac{1}{2}$ m. left, low red earthy hills 1 or 2 miles right, contains rock salt.
		5 20	" "	On border of a marsh.
	Robāpī Isakh	5 30	" "	Ascent and descent of low hills through defiles.
		6 65	S.	Enter narrow place.
	Robāpī Sefīd	7 30	" "	Village, so called, 2 m. lower down valley to the right, a fertile—a pretty valley.
		7 40	S.S.W.	Quit Robāpī Sefīd—cross narrow plain.
		8 45 P.M.	S.	Enter rocky defile, ascent winding by brook.
	Chesh. Moh. Mirzā	9 5	" "	Cross rocky ridge, descent winding and difficult.
		10 30	" "	Cross plain, opposite hills dimly visible.
	Deshtī Rukh	11 45	S. by W.	Ruined ciatarn to the left.
		12 5 A.M.	" "	Halt.
	Robāpī Miyāndeshī	1 10	" "	Go on.
		1 20	" "	At the base of hills running from Mesh-bed to Turshiz.
	K. Shōrā Hīār	2 40	S.W.	Gradual ascent.
		3 10	S. by W.	Winding path in hills.
	Karvān of Kameh (Kalmah).	3 45	" "	Halt in grassy hollow at foot of steep pass.
		5 10	" "	Set out again, steep ascent to summit of hill.
		6 0	" "	Steep descent on S. side of pass.
		10 45	S. by E.	K. of K., in a pleasant nook under the hills, with a small stream.
		0 65	S.S.W.	Set out again, winding path to a lower pass in lower range of hills.
		11 45	" "	Enter plain of Turbat.
		3 0 P.M.	" "	Turbati Haideri.

ROUTE FROM TURBATI HAIDERI.

Date.	Place.	Time.	Direction.	General Remarks.
June 6.	Turbati Haideri	8 0 P.M.	170 E.	Lanes and gardens.
		8 30	" "	Halted for ladders.
		8 50	" "	Broken ground and ravines.

9 10 p.m.	135° E.	Wind through low hills.
10 45	130° E.	Enter plain, clayey, sandy, bare.
11 30	160° E.	Fields of ripe grain, and gardens.
12 35	135° E.	Do. do., once a strong place, now inhabited by <i>Miyāts</i> .
12 45 a.m.	165° E.	At end of a long hill, or chain of hills, half way between Khāff and Gunābad.
1 10	•	Uneven ground.
1 25	•	Halted $\frac{1}{2}$ m. from the village in meadow.
5 0	S.	Meadows and broken ground.
5 25	60° W.	Among low round-topped hills.
6 25	•	Cross a water-course.
6 45	S.	Cross Fajlmānd-rūd, a scanty stream in a wide bed, rises in the Pass of Kameh, N. of Turbat, and runs E. of Turbat-i Haidari.
7 10	•	K. of Hākim-ābād, $\frac{1}{2}$ m. to the right, and low hills to the right; missed the road; ground hilly, and full of deep ravines and gullies.
7 50	S.	Regained the road.
8 0	•	Half missed among the trees.
8 15	•	Ushkurān in ruins, $\frac{1}{2}$ m. to the right.
9 0	•	In ripe corn-fields, deserted K. of Sa'd-ābād, at some distance to the right.
0 25	S.	Winding path between sandy hillocks.
1 20	S.S.W.	
2 0	S.W.	
2 25	S.S.W.	
2 35	W.	
2 55	S.W. by W.	
3 55	•	In a level plain.
3 50	•	Halt for prayer.
3 55	•	Went on.
5 0	•	Ground formerly cultivated.
		Tabas 60 farsangs (220 m.) distant.
		Tūn 14 do. (53 m.) do.
		Level plain.
		K. of Sungal, $\frac{1}{2}$ m. to the right; deserted; sandy, broken ground.
		Halted for prayer.
		Sandy ground.
		Proceeded.
		Level, clayey, bare.
		Halted.
		Proceeded.

1861.	Places.	Times.	Direction.	General Remarks.
June 9.	Róshánwán . . .	h. m. 12 10 P.M.	. . .	A conical hill in a low range 3 m. to the right, a ruined cistern on the left. Towards low hummocks. Over ground formerly cultivated. Castle of Naukár to the right.
	Left Róshánwán . . .	11 0 P.M. 0 45 A.M. 1 10 1 20 1 30 2 35 3 15 12 0 P.M.	W.S.W. W. W.N.W. W.S.W. S.W. S.W. by S. . . . S.	
June 10.	Deláwí . . .	3 15	S.	Ruined village, huts, mill, tower near a brook, then a flat, clayey plain.
	Left Deláwí . . .	12 0 P.M.	S.	Gardens of first village belonging to Gún-abád. A village. Halt. From Tabas : 40 farsangs (147 miles).
				<div style="display: flex; justify-content: space-between;"> <div> <p>do. Mesh-bed</p> <p>do. Bihérján</p> <p>do. Herát</p> <p>do. Jámín, residence of the Náýib of Gúá-ábád, 1 f. (3 m.) distant.</p> </div> <div> <p>do. Róshánwán, 4 f. (15 miles).</p> </div> </div>
June 11.	Gún-abád . . .	12 10 A.M.	S. by W.	Cornfields. Castle of Nókán to the left.
		12 30	S.	A considerable town with a large castle.
		1 35	S.S.W.	A covered tank.
		2 15	S. by W.	Another tank.
		3 6	. . .	
	Kákh . . .	4 10	. . .	<p>A large town reached by a slight ascent.</p> <p>Villages on the skirt of the hills, belonging to Kákh :—</p> <div style="display: flex; justify-content: space-between;"> <div> <p><i>East.</i></p> <p>1. Khánek, 100 houses, 1 far-sang (33 m.) distant.</p> <p>2. Deafá, 200 do.</p> <p>3. Kalát, 500 do.</p> <p>4. Sámí</p> <p>5. Ruchí</p> <p>6. Shíráz-abád } small.</p> </div> <div> <p>7. Zehr-abád, small.</p> <p>8. Zírfát, 300 houses.</p> <p>9. Rígháwíyeh.</p> <p>10. Ríkubín.</p> <p>11. Sínáf, 3 f. (11 m.) distant.</p> <p>12. Naudéh, 4 f. (15 m.) do.</p> <p>13. Fatangáb, 6 f. (22 m.) do.</p> </div> <div> <p><i>West.</i></p> <p>1. Mullá-abád.</p> <p>2. Cherkh-abád.</p> <p>3. Ríáf.</p> <p>4. Astád.</p> <p>5. Dúgh-abád.</p> </div> </div>

June 12.	Left Kákh		1	0 a.m.	S.S.W.	
			1 40		S.S.W.	Ravine between low hills leading to
			1 55		S.	A pass, steep and difficult on each side.
			2 0		S. by W.	Another steep ridge or kotal (i. e. defile).
			2 5			Narrow valley, hemmed in by bare rocky hills.
			2 40		E.S.E.	Tank and tree to the left.
			3 10		E. by N.	An easier pass.
			3 15			Out of hills on plain of Nim Ballák.
			3 35		120° E.	Halted to wait for loiterers.
			4 0			Went on. Hills distant 1 mile on left; about 6 on right.
	Kal'ah Sanghári.		4 5			A village half a mile on the left; halted.
			4 20			Dehsti Piyáz, bearing 105° E.
			5 10			Bádámí, a village on declivity of hills 4 m. to the right.
	Dehsti Piyáz.		5 15			Kal'ah Fálá-abád on the low ground 2 m. to the right.
			5 55		145° E.	Leave Dehsti Piyáz.
	Khidr, or Khidr		6 30			Khidr has 100 houses inhabited by Arabs.
	(Khidr) Beg.					
			1 55		S. by E.	Leave Khidr; plain strewn with loose stones and gravel.
			3 15			Halted 5 minutes.
			3 30			Kal'ah of 'Alí-shád, a deserted village.
	Dehsti Kal'ah		4 0		45° W.	Base of a range of hills. Búrnab-ábád, about 1 m. to the left. The Pass in a range
						of hills, through which the direct road from Kháf to Bihjáñ runs, bore E. about
						16 m. distant.
			4 20			Kal'ah Khán, hid behind low hills $\frac{1}{2}$ m. to the right.
			4 30		35° W.	Enter narrow winding defile between steep hills forming the bed of a small brook.
			5 30		W.	Reach summit of the Pass, guarded by a ruined tower; ascent $1\frac{1}{2}$ hour.
			5 40			Ravine opens a little; a very singular, round, red, bare hill, about 200 feet high to the
						right, formed by the deposit from a calcareous spring, called Tursh-ab (Sour Water).
			5 55		S. by W.	A narrow valley; 1 or 2 brackish springs.
			6 40			A tank to the right, surrounded by willows and cultivated fields. Behúdeh, 2 f.
			6 50			(7 m.) E. of Nokab, the chief place for saffron. Káyin (a city, thence Shehri-Káyin),
						4 f. E. of Behúdeh, 6 f. (23 m.) E. of Nokab. The Bulák (plain or district) of
						Behúdeh has 7 castles (Kal'ehs). Nim Ballák has, 1. Dehsti Piyáz; 2. Khidr;
						3. Manawát behind Khidr; 4. Dehsti; 5. Búrnab-ábád; 6. Mukúbbád (?), behind
						Khidr; 7. Khank, besides those near Dehsti Piyáz.
			3 30 p.m.		S. by E.	Left Nokab; ascend the hills.
			3 45		S.E.	By very narrow rocky path.
			4 10			Pleasant valley to the left.
			4 30			Halt in green meadow near corn-fields.
			4 55		S.S.E.	Went on.
	Nokab					

June 13.

Date	Place.	Time.	Direction.	General Remarks.	
June 14.		b. m. 4 50 P.M. 5 10	S.E. S.	Path very broken and rocky, between limestone rocks, by a small brook. Ascended ridge and entered an elevated plain from N.W. to S.E. bounded by high, bare, limestone hills. Kal'ah Mohammed-abad bore S. by E.	
		5 30	.	Düst-abad, in ripe corn-fields, 5 m. to the right. It belongs to Chahák and Seráyán, about E.S.E. behind, and to the right 2 f. (8 m.) N.N.W. of Düst-abad. Seráyán is the frontier village of Tabas, and distant from Tán about 6 f. (20 m.).	
		6 10	.	Village on the side of the hills, to the left, a few m. distant.	
		6 15	.	Plain bare and hard; descent very gradual. Teghab has about 20 families (Arabs).	
	Teghab	3 15	S.E. by S.	Bare level plain.	
		3 20	170° E.	Halt 5 m.	
		3 45	.	Pass a small tank; halt 5 m.	
		3 50	173° E.	Teghab bears 175° W.	
		4 20	S. by W.	At the tank the Kal'ah of 'Alī-abad, 1 m. distant to the left, the hills to the left being 3 m. distant.	
	Mohammed-abad	4 35	.	Mohammed-abad belongs to Chahák, and is 7 f. (20 m.) from Káyin; 13 f. (43 m.) from Bihriján.	
June 15.	Left Mohammed-abad	2 20 P.M.	175° E.	Over a bare flat plain, impregnated with salt.	
		3 20	.	A ruined and deserted castle, 3 m. to the right.	
		3 50	.	A tank of stinking, brackish water. Mohammed-abad bore 175° W.	
		4 5	due S.		
		4 20	160° E.		
		4 40	150° E.		
		5 25	.	Passed a tank of good water, and lately repaired.	
		5 40	.	Crossed extensive plain, encrusted with natron.	
		5 45	160° E.	Halt 5 m.	
	Chahák	7 20	.	Proceed by winding path over broken clayey ground, traversed by beds of torrents, to Chahák, which bore 160° E.	
June 15.	Left Chahák	3 15 A.M.	S.E.	About 50 houses, and a castle nearly ruined, inhabited by Arabs.	
		4 40	.	On the plain hills about 4 m. to the left.	
			.	Passed a ruined tank, moved towards junction of the ranges of hills on the right and left. High up on the declivity on the right the castle of Seláuk; asafurita abundant in the range of red hills behind it. The whole of this plain covered with withered stems of the kumá, a parsnip-like plant with an edible root.	
		5 25	160° E.	Crossed the dry, gravelly bed of a torrent.	
		6 0	S. by W.	Quitted the direct road to Bihriján, by a narrow path leading to the hills on the right.	
		6 35	.		
	Shaháá	7 0	.	Castle and village. Halt in a garden.	
			.		
			.		
			.		

	Left Shu'dád' . . .	3 20 p.m.	S.	Across rocky hills of limestone and clay-slate. <i>Lentises</i> , <i>terebinth</i> trees, and <i>tamarisks</i> abound.
		4 15	S.S.E.	Plisht tents near a spring in a valley to the left.
		5 30	"	A brackish streamlet.
		6 0	"	A hamlet of 5 houses, and a few tents of Kayin Arabs. Halt for the night.
		6 30	"	Winding course over steep, gravelly hills and deep ravines.
June 16.	Left the Arab butts .	3 15 a.m.	S.E.	Crossed the higher range of hills at a neck of no great height.
		5 20	115° E.	Small brackish spring. Division of roads from Bahrján to Káyin and Gún-Élad.
		5 30	S.E.	The former runs nearly N.E.
		6 0	"	Enter the plain.
	Bilrján, or Birjand .	6 50	"	A city with a citadel (ark). The castle of Khush is 5 f. (17 m.) W. of Birjand (Máhrján ?), at base of hills on the left. Plain 5 m. wide, but contract gradually to about 3 m.
June 18.	Left Birjand . . .	3 40 p.m.	120° E.	Hills on the right have many castles and villages.
	Buzhd . . .	5 30	"	Halt near gardens. Buzhd 2 f. (7 m.) from Birjand, at W. N. W. end of a low chain of hills. Best road, and least mountains, from Buzhd to Derah, is by Serbálah; that by Furk is 4 or 5 f. (15 or 18 m.) longer.
June 19.	Left Buzhd . . .	3 20 a.m.	E.	Rounded shoulder of the low, gravelly hills, which form a division in the hard, gravelly plain of Birjand. This low chain runs obliquely to the centre of the plain. Kal'ah Mirj 5 m. to the left, at the base of the hills.
		4 20	"	A small tank on the right.
		4 35	"	Castle of Sha'beh, on a hill 5 m. to the left, at mouth of a ravine.
		5 5	"	A small stream parallel with the road coming from the East.
		5 25	"	Enter a narrow, grassy valley between low hills.
		6 0	95° E.	
		6 30	"	
		6 55	80° E.	
		7 10	75° E.	
		7 20	65° E.	
		7 45	70° E.	
	Istfár . . .	8 5	"	Small castle of Babú, and a few butts.
			"	Castle of Tannák; some gardens and tillage.
			"	Halt in a garden. Istfár is a village with a ruinous castle on a hill or mound (Tepet). Abundance of water.
	Left Istfár . . .	4 35 p.m.	75° E.	Gradual ascent through valley, bounded by green hills of shale and clay-slate.
		5 10	"	Small ruined fort to the right; remains of houses to the left, called Terughdeh; ascend by winding path between rugged shale-rocks.
		6 10	"	Path divides, going to the left, by the ruined castle and village of Burgezti, and to the right, 116° E., that which we followed.
		6 30	"	The highest point of the delile, beyond which the descent is very steep and difficult, road not easily found.
	Dóshánde . . .	9 25	"	An abundant spring at the head of a fine valley. A ruinous castle in the midst of a few gardens.
June 20.	Left Dóshánde . .	3 45	S.E. by E.	Down a narrow valley.

1841.	Place.	Time.	Direction.	General Remarks.
June 21.	Kal'ah Mohammed- ābād.	h. m. 4 0 A.M.	73° E.	A clump of trees and watercourse to the right. A little cultivation; bed of a torrent running through corn-fields and gardens.
	Der-miyān . . .	4 30	95° E.	A populous village in a wood of fruit trees.
	Furk	4 40	E.	Castle of Furk in sight.
	Left Furk . . .	4 45	E.	Halted in a garden. The strongest fortress in Khorāsān, but commanded by neighbouring hills. Hill of Hissalān 45° E., 6 m. distant.
		5 15	.	Over bare, dry plain.
		2 50 P.M.	100° E.	Ruined tank.
		4 5	105° E.	Tank of good rain-water. Tabas bore 100° E., winding path over level plain, bounded by hills to the E., about 4 m. from Tabas.
	Tabas	7 30	.	Sun set 114½ W. This fortress is the next in strength to Furk; neither have a single gun. It is inhabited by Persians and Persians. Water plentiful.
	Left Tabas . . .	4 10 A.M.	25° W.	Into the plain from the castle.
	Kal'ah Mohammed- ābād.	4 30	.	Castle of 'Alī-ābād ruined and deserted, 1 m. to the right.
June 22.	Left it	5 0	.	About 60 houses and more outside of the walls.
		.	.	Kal'ah of Faiz-ābād 1 m. to the right. Ahmed-ābād 2 miles to the right, inhabited by Persians.
	Destgid	6 5	150° E.	Castle and village has 40 Mīyat families. Through ripe corn-fields. Plain extends 2 m. southward; fragments of lava.
		6 30 A.M.	135° E.	From low rocky hills, below the higher limestone hills, at the S.E. corner of the plain. Gradual ascent of low hills for 10 m. Path divides, one road to Derah on the left, with no water; the other on the right to Rūzah.
		7 10	.	Reached the top of a rugged and difficult pass between huge blocks of obsidian, the chief component of the lower hills.
		7 40	E.	Descent rugged.
		7 50	.	A narrow valley, covered with salt effluence; two very high bare hills opposite.
	Rūzah	8 5	.	Many houses, almost deserted. Inhabited by Persians. Rate of travelling this day about 3½ m. an hour.
	Left Rūzah . . .	11 45 P.M.	S.E. by E.	Broken, rocky ground.
		1 50 A.M.	S.W.	Dry, gravelly bed of torrent. Road divides, on the left, to Lānū, E.N.E. of Derah; on the right, in the bed of the torrent, S., westward.
June 22.		2 10	S.	Stony, rocky ground, between rugged and precipitous limestone hills.
		2 45	S.S.W.	Halted 5 m. for prayers; road between rugged limestone cliffs.
		3 10	S.	Cultivated spot in a narrow valley; fine mulberry trees, ripe.
		4 35	.	

		5 25	• •	Halted nearly as hour.
		6 10	175° E.	Small castle hidden by some low hills.
		6 23	165° E.	Bed of a torrent, bordered by rugged limestone cliffs.
		6 50	•	Isolated from the ravine.
		8 10	•	Over very uneven ground, with volcanic (?) hills $\frac{1}{2}$ a mile to the right; high precipitous limestone rocks $2\frac{1}{2}$ m. to the left. On the low ground large blocks of vesicular lava. Beyond the extremity of the low range of hills to the right, the plain expands to the S. and W.
		8 20	140 E.	On turning a limestone hill, saw Derah bearing 150° E.
		9 15	• •	Along the stony plain, 1 m. from the hills to the left. 250 families of Persian Shif'aba.
		10 15	• •	To it belongs Lânû, 2 f. (7 m.) E.N.E.
		2 20 a.m.	160° E.	From Derah to Lânû 2 f. (82 m.); travelled by a courier on foot in 21 hours.
				Serishâ, 12 f. (44 m.) W. Two black mounds (tepehs) 21 m. distant, S.W.
				The plain is longest from W. to S.E. Kal'ah Siband 12 m. 110° E.
				One mile from the limestone hills on the left. Pass leading to Neb Bandân, E., hills to the right 10 m. distant; those on the left 2 m.
				A well of good water at S. end of the plain.
		3 20	157° E.	Halt 25 m.
		4 35	165° E.	Salt and marshy; salt, reedy pools.
		5 20	• •	Salt spring; tamarisk brushwood.
		5 45	S.E.	Rocky path winding through low hills.
		6 0	105° E.	Halted in sandy ground. A remarkable conical hill 1 m. to the left.
		6 35	S.E.	Sandy bed of torrent.
		11 0	• •	Gradually turned to N.W., round the end of a rugged range of hills, containing the above-named conical hill.
		3 15 a.m.	E.S.E.	A scanty spring at the foot of a precipitous limestone hill, named from a single date-tree close to it. Water good, though hard. Ghurghuri, another spring, about 1 f. (34 m.) to the N. Conical hill 95° W., $\frac{1}{2}$ m. distant, a good land-mark. Centre of Kôh Ateshâneh (fire mount), 35° E., distant about 10 m. From Derah to Khurmâki is, at least, 9 f., (33 m.).
		4 0	E. to N.W.	
June 25.	Left sandy spot • •	4 20	• •	
	Khurmâki • •	4 50 p.m.	• •	
	Left Khurmâki • •	5 10	95° E.	
	Dry bed of a torrent • •	6 0	• •	
	Saw wild asses • •	7 30	105° E.	
	Level, bare plain; lava and Jasper pebbles.	9 0	• •	
	Kôh Ateshâneh, 2 m. to left.	11 20	E.	Broken, clayey, saline soil.
		12 25	• •	Halted in bed of the Herû, a continuation of the Adraskand, which rises 13 f. (48 m.) S. of Herû, and falls into the Deryâi Hânû, about 8 f. (29 m.) from Khurmâki. From the hill above the river the Deryâi Hânû (lake Zerrûh) may be seen in a clear day. From top of bank of the Herû river, high land of Khurmâki bore 103° W.; end of Kôh Ateshâneh 100° W.; its centre 120° W.
June 26.	Bank of Heri rûd (vulga Herat) river, now a chain of fresh-water pools containing many fish.			

As far as it can be collected, from the imperfect account given in his servant's deposition, the remainder of Dr. Forbes's itinerary was nearly as follows:—

1841.

- June 27, Reached Lásh, on the Heri Rúd; hospitably entertained by Sháh-pasand Khán.
- July 3, Quitted Lásh.
- „ 6, Reached the western frontier of Sistán.
- „ 9, Arrived at Chiling, the residence of Mohammed Rizá Khán, governor of the province of Sistán.
- „ 12, Visited the Kúhi Khwajah (Master's Mount), in the lake of Sistán, or Zerreh; spent the day pleasantly there.
- „ 13, Went to see Si-kóh-há, Mohammed Rizá's second fortress, where he stayed three days.
- „ 16, Reaches Dashtak, the fort of Hashám Khán, and stays there five days, making excursions in the neighbourhood.
- „ 21, Reached Husein-ábád.
- „ 22, Proceeded to Bunjar, and halted there two days.
- „ 23, Returned to Husein-ábád.
- „ 24, Hospitably entertained at Burji for two days, by Dóst Mohammed Khán.
- „ 26, Reached Jehán-ábád, the residence of Ibráhim Khán.
- „ 31, Went to Nadalo, on the eastern frontier of Sistán.
- Aug. 3, Set out, accompanied by Ibráhim Khán, on his return to Lásh, and was murdered by him on the banks of the river.
- „ 6, His servants were imprisoned at Jehán-ábád.
- Sept. 6, They were released.
- „ 25, One of them made his deposition before Major Rawlinson, the Honourable Company's political agent at Kandahár.

[This attempt at a supplement to Dr. Forbes's journal of his route has been formed from the materials furnished by his servant's deposition made at Kandahár, the copy of which, forwarded to England, was taken apparently by a native clerk, and is so full of clerical errors as to be in some places scarcely intelligible. Several of the proper names, particularly near the end of the journey, are evidently mis-transcribed, and as they do not occur in books or maps, cannot be corrected without reference to the original document, now probably lost. Of the truth of the deposition different opinions will perhaps be formed; but when the long delays at different stations, the many deviations from the intended route, and the unaccountable return to Lásh, stated in that deposition, are compared with Dr. Forbes's refusal to visit the amir's camp, to examine the ancient Persian tombs, to wait for merchants whose presence would have added to his security, and his general anxiety to proceed directly to Kandahár, so clearly expressed in his journal, the reader can scarcely fail to perceive an incongruity far from favourable to the credit of the deponent. The very fact of the preservation of this journal, contained in two small volumes, seems scarcely reconcileable with the statement that, on the destruction of the traveller's papers, the khán took two small note-books, and said he would keep them for himself: but without knowing how the preservation of any of Dr. Forbes's books and papers was accounted for when they were delivered up, it is impossible to form a decided opinion on the subject.]

XI.—1. *Routes through Kach'hí Gandává. And an Account of the Belúchí and other Tribes in Upper Sind'h and Kach'hí.*

Communicated by Capt. POSTANS, Assistant Political Agent in Kach'hí.

THE following routes embrace nearly the whole extent of country known as Kach'hí, that is, from Bárshúrí, on the other side of the great desert, which separates Kach'hí from Upper Sind'h, northwards to Dádar; and from Kótriya, at the mouth of the Múlá or Gandává pass westwards, to the Mári and Búgtí hills eastwards. The following notes, with a sketch of the country, may be found to afford some information on what has of late become an important line of communication, and coupled with the list of various tribes to be met with between the Indus and Bólán pass, as given in the sequel, may prove useful.

Route from Bárshúrí to Gandává and Kótriya.

Bárshúrí is situated immediately on the southern edge of the desert, being distant from Ráj'hán about $28\frac{1}{2}$ miles N.N.W.; it has two small mud forts with patches of cultivation in its vicinity; dependent for water on rain and nálás* leading from the Mári. The supply is at all times scanty and precarious, being generally procured from numerous kach'há wells (in the bed of a nálá to the westward of the fort), which are exhausted in a few hours. Wells should be sunk at this place, as the greatest inconvenience on account of want of water is always experienced by parties crossing the desert. Bárshúrí belongs to a few Rind Bárdí Belúchís. It is totally deficient in supplies of every kind, and yields scarcely sufficient for the consumption of its few inhabitants. The routes branching off from Bárshúrí are to the eastward, towards Mányúti, Sháhpúr, and the Mári hills, northward to B'hág and Dádar, and westward to Kandah and Gandává.

Kandah† is distant $7\frac{1}{2}$ miles from Bárshúrí in the direction of W. 20 S.; for about 60 miles the road is over a desert tract, though showing in many places that it was formerly cultivated. A small village called Seyyad-ka-kót is passed at a distance of $6\frac{1}{2}$ miles. From thence to Kandah the whole is well cultivated, being within the influence of the dykes or barriers (bunds), of which the principal is at the latter place. The water here is supplied from the northern hills, and is plentiful, or otherwise, according to the seasons. Kandah is a

* Small streams.—Ed.

† Candah, in Arrowsmith's map.—F. S.

walled town of some size and importance; the ground in its vicinity is very extensively cultivated, and the crops of *juwári** are very luxuriant. The principal inhabitants are Hindús and Ját farmers. An agent from the native government of Kach'hí is stationed here for the collection of the revenue from it and the surrounding country. Kandah and the neighbourhood suffered severely from the late ravages of the Ch'hálawán tribes.† When the side above the bund is well supplied with water, Kandah is one of the best halting-places in Kach'hí, and it does not diverge materially from the high road to B'hág.

Ud'háná, distant N.W. 11 miles 2 furlongs. The road lies through ground extensively cultivated for some distance to the W. of Kandah, and thence over a desert tract. At 3 miles the village of Mawlálewén is passed. Ud'háná was formerly a large place, but is now thinly inhabited. A scanty supply of water is obtained from a few intermitting (Kach'hí) wells, and a party of any considerable strength would have to cross to the barrier (bund) about 4½ miles to the N.W. for a supply. A thick underwood‡ surrounds Ud'háná to the westward and south.

Gandává is distant from Ud'háná 15 miles 3 furlongs; the general direction being about W. 10° N., the whole road lying over a perfectly waste and uncultivated tract, though formerly it might have been cultivated to a great extent, from the remains of dykes (bunds), and the general appearance of the soil. It is said that in the time of Nasir, khán of Kelát, the waters of the Indus were brought to within a few miles of Gandává, and from the remains of nálas, extending in various directions over the great Bárshúrí desert, it is more than probable that such was really the case. Gandává was formerly the richest portion of Kach'hí; and under the able government of Nasir Khán yielded a large revenue, as well as provided the hill-tribes with the greatest proportion of their grain and other supplies. Its produce is millet§ and wheat. This, the most important town of Kach'hí, was the winter-residence of the kháns of Kelát. Gandává is surrounded by a high mud wall, and has three gates, and at the time I visited it had just suffered from a complete sack and pillage by the Ch'hálawán tribes, who had fired, and, if

* *Andropogon*, or *Holcus Sorghum*, commonly called Millet.—F. S.

† *Belúchí*.

‡ Jungle, jangel in the MS.; but that Sanskrit word properly signifies a wood or forest. It seems to have obtained the sense of 'underwood' among our Anglo-Indians, from whom some late writers have adopted it.—F. S.

§ *Juwári*, *Andropogon Sorghum*.—F. S.

allowed, would have totally destroyed it. Gandává was an important dépôt for the trade between Shikárpúr, Lárkhánah, and Kelát, by the way of the Múlá* or Gandává pass, all of which was in the hands of Hindú settlers. The Bráhúwís cultivated the land considerably,† and moved to the low country in the vicinity of Gandává with their flocks during the inclement season of the higher country. A deep-bedded mountain-stream from the N. flows immediately to the westward of the town, and affords facilities for irrigation to a great extent of country. Gandává will be long ere it recovers from the blow it received in October, 1840, from the ravages of the Ittázaýis and other Bráhúwí tribes under Kamál Khán and Ralím Khán. The losses were estimated at $2\frac{1}{2}$ lacs of rupees; and the Hindús, against whom nearly all the violence of the rebels was directed, were stripped of everything, and their houses set on fire. The district of Gandává contains about twenty villages, all of which are assessed to the revenue with it. The routes from Gandává are, to the S. Lárkhánah *viâ* Panjók and J'hall. To the N. to Dádar *viâ* Sórán, San-ní and Nau-sherá, W. to Kótriyá and the Múlá pass, thence B'hágbánah, Wadd, and K'hózdár to Kelát E.; S. to Shikárpúr, *viâ* Bárshúrl, Ráj'hán, and Jámiderah.

Kótriyá (or Kotrah), W. 10 S. from Gandává $7\frac{1}{2}$ miles. The ground is cultivated to some distance W. of Gandává; a thick wood then extends to within 2 miles of Kótriyá, situated on the edge of a wide and deep ravine, having every appearance of being the bed of a formidable torrent during the rainy season or when fed by the mountain-streams. Kótriyá is a respectably-sized, walled town; of late years it had a large share of the trade of Gandává, over which it has the advantage of the proximity of the Gandává pass, being only about 4 miles from its mouth, and about 2, in a direct line, from the great Hálá range. There are various streams flowing past Kótriyá, coming from the S.W., having their source at Panjmuwárah, near Pír Chattar, in the pass, and the produce is therefore very rich to the W. and N. of the town. The wheat-crops in this part of the country are described as unusually fine. There are one or two gardens at Kótriyá, the pípul,‡ acacia, and nim§ trees in which afford a great relief to the eye, after the sterile and treeless wastes traversed from Upper Sind'h to this western boundary of Kach'hí.

Gáján, 9 miles N. 20 E. from Kótriyá. The first portion of

* Istúllá—another form of the word Bálán.—F. S.

† That is, cultivated through the agency of Játas, for the Bráhúwís themselves are not cultivators.

‡ *Ficus religiosa*.—F. S.

§ *Melia* (*Azhal-dírahht*) *Azadirachta*.—F. S.

the road is broken and much intersected by bunds and remains of cultivation; thence over a level and uncultivated country. Gáján is a respectably-sized and well-supplied town, with the whole extent of country E. between it and the hills, and to the N., under cultivation; several large streams pass it, running from the E. due W., and are the cause of the richness of the crops.

Shórán is 15 miles N. 10 E., following the foot of the hills across a deserted and desolate country, intersected by deep and wide ravines with low wood, but without water in wells or streams; at present there are no appearances of inhabitants or cultivation throughout the whole of this tract, but numerous ruins attest that it was formerly otherwise.

Shórán is a place of some size and importance, walled in, and having a well-supplied bázár. There is but little cultivated land in its neighbourhood, and the crops looked thin and bad; the running streams, however, are not apparently turned to due advantage. Shórán is the head-quarters of the Kind Belúchis, acknowledged by all the Belúchí tribes as their head and chief. The present representative of the Rinds is a mere boy, Imám Bakhsh, son of Pirdár Khán, and his possessions, which were formerly very extensive in Kach'hí, extend now only to Shórán and the neighbouring districts. Shórán is about 2 miles from the hills.

San-ní* is distant from Shórán $24\frac{1}{2}$ miles N. 20 E.; the whole distance being a perfect desert: it is a small walled town, having running streams and every facility for the cultivation of the soil; but as it was deserted and the crops destroyed when I visited it, their extent could not be ascertained. The place was, until lately, held by a portion of the Gathúwí tribe of Belúchis. From San-ní a pass of that name through the mountains leads to Kelát, which may be reached in something less than 2 days, but the road is only practicable, and with difficulty, for lightly-laden camels; horsemen in many places must dismount.

Mihisir, N. 30 E., 6 miles and 3 furlongs, a considerably-sized, open town, on the edge of a large ravine, with water and a dyke (bund); cultivation near it is very plentiful.

Dádar, N. 30 W., 24 miles 6 furlongs. At a distance of 2 miles 6 furlongs the pass is entered through a low range of rocky hills known as the Ch'hótá (Little) Bólán. The road through this is generally pretty good, though the hills on either side occasionally approach so as to form narrow gorges, where

* Spelt San-ní in M. Tassin's maps, but his authority cannot be safely relied upon.—F. S.

an enemy might seriously impede the progress of troops. The length of this pass is 3 miles; after quitting it the road is generally level along the skirts of a low range of hills to the E., and leads direct towards Dádar, without diverging towards Naushérá under the hills to the W. Water-courses from torrents cross the road occasionally. The whole is a desert tract, cultivation commencing only within a few miles of Dádar. The town of Dádar ranks next to B'hág in size, and is situated on the edge of a ravine, distant about 5 miles to the E. of the Bólán pass. It is walled in, but has considerable suburbs. The bázár is well supplied, and several of the larger Shikár-púr houses have agents here to assist in the trade between that place and the upper country. The cultivation in its vicinity is very rich and plentiful, from the abundant supply of water in running streams from the western hills. Indigo, wheat, cotton, and juwári form the principal crops, the former in no great quantity. Dádar had formerly a Hákím from the Kelát chief for its government and collection of the revenue. It formerly belonged, I believe, to Mír Sháh Nuwáz Khán, late khán of Kelát. Most of the surrounding villages are en'áms [endowments] and jáhír [fiefs] to various chiefs and tribes. The whole distance from Bārshūrī to Kótriyá by the route above detailed is 41 miles 5 furlongs (say 42 miles), and thence to Dádar 79 miles 5 furlongs (say 80 miles), or about 122 miles from Bārshūrī to Dádar by the Gandává route. In remarking generally on the tract of country traversed, I should observe that there can be no doubt that the facilities for cultivation along the whole line of country skirting the western hills from Gandává to Mihisir are unusually great, and the soil being, in common with that of nearly the whole of Kach'hí, a rich alluvial, is very productive. The streams are generally deep and rapid, not depending upon rain in the hills, but flowing from natural springs, and never failing. This part of Kach'hí is, however, but very thinly inhabited, and a great portion of its population, the Bráhuwís, migrate during the hot season to the higher country, coming down from October till March or April to superintend their farms, &c. Gandává and its vicinity was formerly, as I have elsewhere observed, one of the great sources of supply of provisions to the Bráhuwí hill-tribes; but the flourishing condition of that place and the western portion of Kach'hí generally has declined from mismanagement under subsequent rulers; nothing can possibly exceed the sterile appearance of the hills; their characteristic clay and limestone formation remains without a particle of vegetation to relieve the eye. Snow may be observed on the high point at a short distance S. of Kótriyá, but seldom lower

down the ranges; as the elevation thence perceptibly diminishes. I must not omit to mention that alum and sulphur are found in the hills to the N. of Kótriyá, and form articles of trade between B'hág and Shikárpúr; and there is every reason to believe that this range would be found to yield other minerals. The streams are more or less impregnated with mineral substances, and hot springs are frequently met with. The natives count five passes into the upper country, between and including the Gandává and Bólán, of which we only know of two from actual survey. The importance of inquiries on these roads into Khorásán is obvious.

Route from Khángar to Lehrí in Eastern Kach'hí.

Khángar is a well-built mud fort on the southern side of the Bárshúrí desert, and in the direct road from Upper Sind'h to Eastern Kach'hí. At present it is abandoned and uninhabited, from the excesses formerly committed on it and the neighbouring country by those inveterate plunderers the Dumkís, Jekránís, Búgtís, &c. A large nálá formerly led the water from the river-inundations close to the walls of Khángar. The surrounding country is still well cultivated, and protection is afforded to it from a neighbouring post of our cavalry.

Cross the Bárshúrí desert in a direction about 10° W. of N. to Mániyútí, distance 20 miles. At about 11 miles this route crosses the "Núriwah" nálá, running from S.E. to N.W., the relic of an important channel for conveying the inundations of the Indus across this tract, now choked up and long disused. Mániyútí is a small fort, inhabited by a few Umránís, Belúchís; but the facilities for pasture which it possesses to the south-eastward attract a great number of Játís with their flocks, and these are scattered over the neighbouring country in temporary sheds or huts. The supply of water is dependent on rain in the eastern hills, whence it is brought to Mániyútí by nálás. Kach'hí wells in the nálá, to the east of the fort, supply a limited quantity during the dry season. The importance of water to parties crossing in this direction, however, has rendered it necessary to sink a well of masonry; and though, like all the water procured from springs on the edge of the desert, it is brackish, yet cattle and the inhabitants themselves drink it. There are some exceedingly fine patches of cultivation to the east and south, with large *hurins* of grass. The mustard-seed plant (*shagraf**) is in great plenty; the other crops are principally juwárf. The Umarándyís have the right

* Properly shigarf, i. e. fine, rare, &c.—a Persian epithet, and not properly the name of a plant.—F. S.

of zamíndarí over this place, under sanads [patents] from the kháns of Kelát.

Sháhpúr, $12\frac{1}{2}$ miles from Máníyútí, N.E.; the road is level, but sandy and heavy, across the Lehri and Laráhí náls, the latter within 2 miles of Lindah, a place formerly of some size and importance, and belonging to the Bangah tribe of Játs, but at present it is nearly depopulated, owing to the ravages of the marauders. Lindah is 1 mile from Sháhpúr; the road, passing along the edge of high sand-hills, is very heavy. Sháhpúr is situated in an uncultivated sandy plain, about 6 miles from the Búgtí hills. It is a well-built, thickly-populated, open town, indebted for its comparatively flourishing condition in the heart of a country inhabited by professed freebooters, to the fact of its belonging, as an enám, to the family of an influential seyyad. An excellent supply of water is procured from Kach'hí wells, at a distance of about $\frac{1}{2}$ of a mile to the south of the town, in the bed of a large river: this latter is dry, except immediately after heavy rain on the hills. There is a considerable quantity of cultivated ground at some distance from Sháhpúr, at Sherání, Gúgar, &c. The sand-hills, before alluded to, continue to run nearly due eastward from Sháhpúr: following the general direction of the Búgtí range, they terminate at a place called Uch'h, where is a plentiful supply of water from the hills. There is a somewhat shorter and more direct route from Sind'h to Sháhpúr and Eastern Kach'hí, by crossing over from Mubarikpúr by way of the small fort of Gamáh and the wells in the desert, known as Dádókár. The distance is about 30 miles.

Chattar, $10\frac{1}{2}$ miles. The road, skirting the hills in nearly a N.E. direction, is open, but sandy and heavy, lying through large patches of high grass, and a thick wood of bábul [*Acacia Arabica*]. Chattar is a walled town of some size, with considerable cultivation in its vicinity. It was formerly the stronghold of the Jekrání tribe of Belúchís, the most active of all the plundering clans, who, with their chiefs, Daryá Khán and 'Túrk 'Alí, took Chattar and its lands from the Wayírís.

Phulájí, 10 miles in a N. direction, by a road through a thick wood of tamarisk and bábul. It passes the fort and village of Jehádá, 4 miles from Chattar; cultivation is abundant in the neighbourhood of this place. Phulájí has two small mud-forts well supplied with water, and has much cultivated ground to the east and north; though the general feature of the surrounding country is wood.

It commands the pass, $5\frac{1}{2}$ miles distant E. to Dírah and Khán, the Mári and Búgtí strongholds. There is a road across

the desert due W. from Phulájí to B'hág, by way of Chácháh, 42 miles distant. Káhán, in the Mári country, is distant from Phulájí 56 miles, by way of Sartáf and the Nalusk pass. Dírah, in the Búgtí country, is 64 miles.

Lehrí, 13½ miles in a N.W. direction. The first part of the road lies through thick wood and heavy sand, but the remainder through an open and occasionally cultivated country. Lehrí, the largest and most important town in Eastern Kach'hí, is walled in, and has a well supplied bázár, with a considerable trade between B'hág, Tallí, and Lehrí, which supplies the wants of all the low country between it and Sháhpúr, as well as the hilly country of the Máris and Búgtís. There is much cultivated land about Lehrí. About 3 miles to the S. a road leads from Lehrí to Káhán, but it is a difficult route, barely practicable for camels, and measuring about 85 miles; a thick wood lies between Lehrí and the hills, and the bed of a wide river passes close to the southern wall of the town; this, after rain, leaves a formidable stream. Water is abundant, being always procured on digging a few feet deep in the bed of the river; but in those who are not accustomed to it, their water appears to occasion ulcers; and the same is the case in Western Kach'hí, particularly at Dádar. From this evil our troops suffered severely. There are routes from Lehrí to the Khajjack country, through Mall, Tallí, and Kúrk to Dádar by Togáchí and Mití.

The whole distance from Khángar to Lehrí is 66½ miles. The tract of country traversed from the northern edge of the desert at Mániyútí differs from the central and western portions of Kach'hí in the light and sandy nature of the soil, as well as in the want of running streams. Cultivation is consequently very partial, being dependent on seasons of rain,* the supply of water from wells being little more than sufficient for men and cattle. Forage is plentiful along this line of country, which is famous for its abundance of cattle and sheep. Cotton (in favourable seasons) and juwárá are the principal crops. The Búgtí and Mári hills which commence at Sháhpúr, are apparently a spur from the great Suléimán range, running nearly N. and S. They do not rise to any considerable height, but are sufficiently elevated to produce a great change of climate. The highest portion of the Mári hills may be about 2000 feet above the level of the plains. Lime in some portion of these hills appears to prevail in so great a degree, that alabaster was observed in considerable quantities. Their

* The rainy season in Kach'hí is from January to March. The rains are very heavy, often accompanied by severe thunder-storms.

general appearance does not differ, however, from the great range, a conglomerate of clay and lime, intermixed with large round stones, being their most common feature. The roads or passes through these hills are, for the most part, the sandy beds of torrents overhung with precipitous cliffs; and water is alone procurable (except at Dírah and Káhán) from pools left by the rain, and these after a certain period become brackish. At Dírah there is a natural spring called Sírák, in Belúchí (a corrupt contraction of Siyáh-Ab) [Black Water]. This phrase is always used to distinguish spring-water from other water, as is likewise that of "Pir Chattar."*. The Káhán and Dírah valleys are highly productive, particularly of wheat. The Márís and Búgtís also feed large herds of cattle and flocks of broad-tailed† sheep. Alum and sulphur are found in mines near Tallí in these hills, and form articles of trade. The whole of the low and hilly country above mentioned is inhabited by Belúchís, who are inveterate plunderers; viz., Dumkís and Jekránís in the plains; Márís and Búgtís in the hills. (Their subdivisions, &c., will hereafter be given.) The two last have ever held themselves independent, except in a feudal service to the Khán of Kelát; and their strength of position, and proverbial fierceness and courage, have enabled them always to maintain their independence. The Dumkís and Jekránís long held the plains of Kach'hí completely at their mercy; and being well mounted, defied pursuit. It was only after the most active and harassing campaign that these scourges of the country were put down. The Játs cultivate the land, and feed the flocks of the Belúchís. A communication exists between the Márí and Búgtí hills and Harand-Dájil, the most southerly of the Sheik‡ possessions. These places formed, up to the time of the late Khán, the extent of the Kelát possessions eastwards.

Route through Central Kach'hí from Bárshúrí to B'hág, &c.

Kásim-ka Jók, § a small village 19 miles N.W. from Bárshúrí, on the Nárí river, which, rising in the hills beyond the Khajjak country, traverses the whole of the centre of Kach'hí till lost in the desert. The Khajjak tribe, however, holding this important source of fertility in their possession,

* Pir Chattar may mean "Cunning Bluebeard," and be a nickname. It is not clear whether the writer means that the spring at Pir Chattar is called Siyáh-Ab, or that springs are here called by that name or Pir Chattar indifferently.—F. S.

† Dunbah in Persian.—F. S.

‡ Sheik in the MS. The spelling of this word Seik, and then Sheik, almost like the Arab Sheikh, is a remarkable instance of the puzzling irregularity of our common orthography. Sik'h is pronounced nearly as Shik'h in some parts of India.—F. S.

§ Kásim's market. Jók is the Sind'hí pronunciation of the Hindi chauk or chok.—F. S.

have of late years so diminished the supply, which would be otherwise abundant throughout its whole course, that the water in the Náří seldom (except after heavy rains) reaches further S. than B'hág, and even at that place the quantity is limited. At 14½ miles this road passes the village of Mír-húr, crosses the Náří, and thence to Kásim. The juwáří crops are very luxuriant.

B'hág,* distant from Kasim ka Jók about 19½ miles, is considered as the capital of Kach'hí, more from its central position than from its trade or actual importance. It was, under the Kelát rulers, the residence of the Nawáb and the seat of government of the province. It is a large walled town, with a population of about 8000, principally Hindús. It carries on a trifling trade in the products of Kach'hí with Shikárpúr, but it has principally a transit trade, being an entrepôt for the caravans † to and from that place to Khorásán. The surrounding country has the most desolate appearance. The population throughout the whole of the plains is scanty, and the villages are few and widely scattered. Juwáří and cotton are cultivated immediately in the neighbourhood of B'hág, and the former attests, by the richness of the crops, the capabilities of the soil of the low country for purposes of cultivation. The soil here appears more loamy than the hard clay generally met with. There are no wells at this place, and the river Náří supplies the water used at B'hág. It has the remains of one or two fine tombs outside the walls, which are in a state of ruin, and afford but little protection to the town. They have bastions and loopholes.

Roads leading from B'hág to Gandává, Hájí, Mitrí, and the Khajjah Country. Lehrí, Phulájí, and Eastern Kach'hí, Dádar, and the Bólán Pass.

The regular Káfilah [caravan] route is by way of B'hág to Hájí-ka Shehr, and thence to Dádar; that from Mihisir to the latter place has been already described, and that from B'hág to Mihisir, 16 miles N.W. over a generally desolate tract, completes the junction of the route along the western hills with that of Central Kach'hí.

Hájí-ka Shehr, 16 miles due N. from B'hág on the Náří, is a small walled town, in good repair. Its permanent inhabitants are principally Játs and Hindús. The Bráhuwís take up their residence here and in the neighbourhood during the

* The author invariably writes Bâgh, as if this were the Persian word for garden; but both M. Tassin's maps (Calcutta, 1837) have B'hág, as well as Sir Henry Pottin-ger's, which is probably the best authority of all.—F. S.

† Káfilahs.

winter, living principally in túmans, and going to the bázár for supplies. The bázár at Hájí is well supplied; but being on the high road for Káfilahs, it has principally a transit trade.

From Hájí to Dádar the distance is about 22 miles N.W. by way of Mitrí; and from Bárshúrí to Dádar, by B'hág and Hájí, 76½ miles.

It will only be necessary to remark on the central portion of the province traversed in the above route—that is, from Bárshúrí to Dádar—that the country is thinly inhabited, and partakes more of a desert than a cultivated tract. The Nárí and the canals which might be drawn from it, and of which there are numerous remains, would render this part of Kach'hí, however, most productive, and capable of supporting a large population; but misgovernment on the one hand, and the ravages of the Bráhuwís on the other, have all but reduced Central Kach'hí to desolation. The cultivators and fixed inhabitants are generally Játs, though the Bráhuwís live at many of the places on this route during the cold months. The roads are perfectly level, and the river or nálas only offer impediments after heavy rain, when they become impassable.

The route from Hájí to Sibbí and the Khajjak country is by way of Mitrí, a walled and well-supplied town, and Kurk; the general direction is about 20° E. of N., and the distance 24 miles. This tract is generally uncultivated till within about 4 miles S. of Kurk; thence, as far N. as the hills, the country is very productive. The whole of the Khajjak country, of which the Fort of that name is the capital, is very rich, particularly in wheat. The Khajjak tribe, as before stated, held the means of irrigation by the Nárí completely in their hands; and their crops and extent of cultivation were unequalled in any part of Kach'hí. Roads lead from Gulu in the plains near Khajjak, to Bádrah, Mundege, Kwut, and Tallí, the capital of the powerful tribe of the Shá-dú-zayí Afgháns,* or Pat'háns, the estimated distance being 46 kós, or about 70 miles. This northern corner of Kach'hí, that is from Lehri N.W. to Khajjak and Gulu, is an unexplored part of the plains; but there can be no doubt that it is a rich and important one, as it borders on the Márí country; the Pat'hán tribes, by whom it is chiefly inhabited, as the Shá-dú-zayís, Shírúnís, Bazdárs, Kótriyáns, Daman Lúnís, and Pannís, are generally at war with the Máris and Khajjaks: their rich country constantly inviting the incursions of the former. From Khajjak to Dádar the distance is about 24 miles.

* The author says Afghán Pat'háns; but the latter is only a synonymous term for Afghán.—P. S.

The following routes, derived from the best native information, are connected with the portion of the country N. of Háji:—

Note of a Route from Tallí in the Plains to Káhán.

On leaving Tallí one proceeds easterly about 6 miles to the commencement of the Hills. There is a pass which is not considered as difficult; camels can traverse it; and my informant says guns could do the same. On crossing one or two hills, one descends into the valley of the Lehri river, which is followed for 18 miles, and the first halting-place is on its banks, 12 kós from Tallí. The hills on either side are not described as precipitous or high. Passing over another range of easy hills, on which is the second halting-place, 12 kós from the former, the road descends gradually to a lower tract of country, in which, about 4 or 5 kós from the hills, is Káhán, 8 kós from the second halting-place. The total distance is 32 kós. There is no want of water, wood, or grass along this road; and the road itself is said to be good. It bears the name of Gandává, and is said to have been formed during the time of Taímúr Sháh, an ancestor of Sháh Shujá (I give it as the native told me, having no books of any sort nearer than Sakkar): my informant says that this road, like many others in the hills, is used by the natives without difficulty with camels. He says it is a good route to Káhán; and, as far as I can understand him, there are no passes in it to present impediments: in fact, he merely describes a hilly country covered in parts with low brushwood and grass.

Two Routes leading from Gulu in the Plains to Tallí.

1st route through Bádrah and Hernáyi* :—

Entering the pass about a kós beyond Gulu in a northerly direction, one crosses the stream of the Nári several times during the first 10 or 15 miles: the road is good, and the pass open, being always several hundred yards wide. The ascent is gentle, and the pass is quite practicable for guns, Míhráb Khán's two guns having traversed it as far as Choteílí, and also, I believe, Kwut, during his Mári campaign, about 20 years ago.

The hills on each side are in some places accessible to infantry, in others scarpéd. Infantry can generally go along the top of them. Plenty of grass is to be found.

The waters of the mountain-streams do not come down violently till the months of May and June.

* Perhaps Hernéyi.—F. S.

The road is generally stony, but clear of obstacles. On reaching within about a kós of Bádrah the defile terminates; and one marches through a hilly country. Bádrah,* 12 kós from Gulu, is a small fort belonging to the Bárú-zayís. There are about eighty families in it, and three or four banyans. The country around it, in the valley of the Nárí, is cultivated chiefly with wheat. There is no want of water or grass. Leaving Bádrah and skirting the Nárí along a good road, with high hills on each side, the second march is Miyah Shálm-ká Kach'h, 10 kós northwards. This is a small village of thirty or forty houses of priests.† Grass is to be had. 10 kós further N. one comes to Hernáyí, along the same description of road. There is a fort with 200 families, and ten or fifteen banyans. The place belongs to the Makrání Paṭ'hans:‡ wheat, &c. is cultivated in the neighbourhood. From this place one takes a north-easterly direction along the banks of a stream that joins the Nárí at Hernáyí, and passes at times over gently swelling hills to Choteílí, a village of sixty families and twenty banyans, also belonging to the Makrání Paṭ'hans. There is a fort and a tower (Burj) here. Wheat and rice are cultivated, and grass can be procured. Muṣṭafá Khán, Míhráb Khán's general, took his two guns as far as this place. An excellent road leads one from Choteílí to Tallí. Leaving the hills about a kós beyond Choteílí, one emerges into an extensive sandy plain which, as one approaches Tallí, is well cultivated and studded with villages. Tallí belongs to the Shá-dú-zayí Paṭ'hans. It seems to consist of a cluster of small villages. There are six forts occupied by the heads of families, and Haizu-l-lah Khán and Ríshu-l-lah § Khán are the two most powerful chiefs. There is another named Dínúh Khán. This place is very wealthy, and various kinds of grain and tobacco are cultivated near it. Water is obtained from Káriz (water-courses). There are 500 families and forty or fifty banyans, by whom a considerable traffic is carried on. The Sheíkhs || and Shá-du-zayís are great horse-breeders, and are hostile to the Máris. The whole distance from Gulu to Tallí by this road is estimated at 5 manzils ¶ (stages), or 46 kós.

2nd route through Bádrah and Mundaí:—

* Brada, in the MS.—F. S.

† Probably Fakírs or Dervishes, i. e. Ascetics; as the Muselmáns have no priesthood.—F. S.

‡ That is, Afghán tribes, who have emigrated from Makrán on the Persian Gulf.—F. S.

§ This name has probably been misspelt.—F. S.

|| Shik'h, i. e. Sik'hs?—F. S.

¶ Manzil, or Meshlah, are Arabic terms, signifying a day's journey.—F. S.

To Bádrah as above described; then taking a north-easterly direction along the banks of the Báji, which falls into the Náří; a little below Bádrah one comes to Mundaï, 8 kós. The river passes close under the walls. Mustafá Khán's guns came to this place. The village or fort is small, belongs to the Máris, and when inhabited, can lodge about 100 families; but there is no cultivation about at present, and it is supposed that the place is deserted; grass is plentiful. The hills are 1 kós distant, and the town has a large masjid (mosque), built by 'A'lam Khán Bárúzayí many years ago.

Four kós from Mundaï, in an easterly direction, and proceeding up the course of the stream, one reaches the village of Kwut, belonging to the Khajjaks. Mustafá Khán's guns came here. The road is excellent, except half a kós of broken sand-hills nearer Kwut than Mundaï; but even here there are no obstacles to guns. Eight families and six or seven banyans occupy the place; wheat is cultivated, and there is plenty of grass. On leaving Mundaï one passes in a direction about 2 points E. of N., over a hilly country with a good but stony road to a pool of water, 8 kós. The pool may be 50 yards in diameter, and 2 feet deep: there are several other pools along the road at a little distance from it. Continuing on the hill road for 2 kós more, one enters a Ran (desert) of sand with an excellent road to the village of Puwer, 10 kós from the water. This place contains about 100 families of the Sanáchi or Manáchi* Paṭhans, who are hostile to the Máris. There are no banyans; the land is cultivated in the proper season; and the water, though from wells only 3 or 4 feet deep, is good; grass is plentiful; some say that Puwer is at present uninhabited. On leaving Puwer one proceeds along the plain for 2 or 3 kós, and then for 2 or 3 kós further over hills and stony ground, among which a nálá runs from W. to E.; the road then proceeds along the plain again to Tallí, which is 12 kós from Puwer. The entire distance from Gulu to Tallí by this road is estimated at 5 manzils or 50 kós.†

Salar is a Husseíní Jarín village, 4 kós S.E. of Tallí, with a fort; 200 families, six or seven banyans, great cultivation, and water from Káriz.

My informant describes water and grass to be most plentiful all over the hills, but he did not give me so favourable an account of the fuel.

* The writer says that he had written this name in the original character so hastily that he was doubtful how it ought to be read.—F. S.

† Ten kós, equal about 18 miles, is an average day's journey in most parts of Asia and Africa.—F. S.

2.—*A short Account of the Belúchí and other Tribes who inhabit Upper Sind'h and Kach'hí.*

Along the river Indus from B'hakar, as far as Shikár-púr, the country is principally inhabited by Játs and the Belúchí tribe of Khósahs. The former, who are found scattered all over the low country, alluded to in the previous routes, are considered as the aborigines* of the land, the Belúchís being, as they acknowledge, foreign invaders. The Játs are solely cultivators and breeders of cattle, but some few of them have attained importance as zamindárs (land-holders). The Játs in Sind'h and Kach'hí are generally poor, and in most cases, the servants and labourers of the Bráhuwí and other Belúchís. They have, in common with all those tribes, various and extremely numerous subdivisions. Játs are to be found in every portion of Upper and Lower Sind'h, and even as far eastward as Kach'hí, where they feed their flocks in the Baní (grass lands) and islands of the Ran.† These people are believed to have been the original inhabitants of the country, who were converted to Islamism by their Muselman invaders, and this supposition is supported in some degree by their own traditions as well as by the early mention of many of their tribes in the native historical works on Sind'h. The Játs are a most useful class of people, and under a more vigorous and equitable government would prove valuable subjects; but being constantly exposed to the violence of marauders under rulers who offer no protection to their subjects, in a country also where the cultivator too often sows for the robber to reap, they dwindle down to an inferior and servile state, living principally on the produce of their flocks in temporary habitations, and moving about as forage or water may require. The following are subdivisions of the Ját tribes found in Upper Sind'h and Kach'hí. The Beyáhs and Abrahás‡ are alone zamindárs, and of some importance. The Játs divide themselves into two classes, as cultivators and camel-breeders.

1st Class, Cultivators:—

* Their name implies this, for Ját, Ját'h, or Jét'h, as it is occasionally written, is a corruption of the Sanskrit word Jyēśht'ha—old, ancient.—F. S.

† Ran, or rīn, probably from the Sanskrit word aranya, a desert, signifies a sandy desert, but is peculiarly given in Western India to that singular sandy morass which almost encloses Kach'h Proper, and separates it from Sind'h, and the Great Western District called Thar (S'thala); for an account of which see Col. Tod's *Rajpatana*.—F. S.

‡ Bengal and Arabs in the MS., which has here, no doubt, been mistranscribed; as Játs could not be called Bengálís and Arabs. The Beyáhs and Abrahás, being the two first named on the list, manifestly belong to the most considerable of the agricultural tribes, those who are zamindárs or landholders.—F. S.

1. Abrah	12. Khurirah
2. Bélyah	13. Wagar
3. Bachúwad	14. Tihín
4. Déyah	15. Gónyá
5. Kákáputrah	16. Powir
6. Búkējah	17. Sūárah
7. Sarkí	18. Mihr
8. Dunir	19. Bangar
9. Junéjhár	20. Badání
10. Maráfání	21. Káki
11. Lódrah	22. Batú

2nd Class, Camel-breeders :—

1. Dínarí	10. Mir
2. Gadrž	11. Manjídah
3. Shádwal	12. Babar
4. Mandrah	13. Shórah
5. Sangarání	14. Hússá
6. Wáwanj	15. Vaniyar
7. Gád'hí	16. Hajánah
8. Sandilah	17. Chalgari
9. Waswánah	18. Wáluwát

Of these subdivisions Nos. 2, 4, 5, and 17 have more claims to Belúchí than Ját origin, but as they occupy themselves entirely as camel-breeders and drivers they are considered as belonging to the latter class.

The Khósahs* are a numerous tribe of cultivating Belúchís, principally inhabiting the tract of country before alluded to; they are occasionally met with on the southern edge of the Bárshúrí desert. Their quiet habits of life have left the Khósahs few friends among their predatory brethren; and they therefore seek that part of the country where they are least likely to be molested, and claim the protection of the Khaír-púr government, to which they are tributary. The Khósahs were firm adherents of the Kálórá dynasty, in whose cause they suffered many severe losses. They had formerly considerable possessions to the E. of the Indus, beyond Khaír-púr, but of these the Tálpúris have deprived them. This tribe has four subdivisions :—

1. Kalúlání (the Chief)
2. Bakrání
3. Júriyání
4. Súriyání (who cultivate the land near the desert).

The Khósahs are feudal retainers of the Khaír-púr branch of the Tálpúri family.

* Perhaps Kháqshah, i. e. peculiarly, especially Belúchís.—F. S.

Jat'húwís.

The Jat'húwís are a small Belúchí tribe which inhabits the tract of country immediately to the E. of Shikár-púr, and extends eastwards to the Indus and the confines of the Burdíkar on the N. The Sind'h canal bounds the Jat'húwí country to the S. Portions of this tribe are to be found elsewhere, and in Kach'hí at San-ní as before mentioned. The Jat'húwís were a troublesome and predatory tribe, but have of late years been much restrained by the Khaír-púr government, and they are now peaceable, if we except occasional feuds, common to all the Belúchí tribes, between them and their neighbours the Burdís, which boundary disputes tend to keep up. Such feuds show themselves in mutual violence, till the interests of the parties suggest a compact between them for a certain period, and such truces are seldom infringed. The Jat'húwí country is very favourably situated for cultivation, and is productive. The chief is a zamindár, under feudal service to Khaír-púr. The following are the subdivisions of this tribe, whose principal town is Dháráp'har, about 20 miles E. of Shikár-púr:—

- | | |
|--------------|----------------------|
| 1. Brahmaní | 7. Sangléjar |
| 2. Bijarání | 8. Rodráni |
| 3. Badání | 9. Sherrán |
| 4. Shádinjar | 10. Khósán |
| 5. Jakili | 11. Sayyad-Khándáni. |
| 6. Sahawáni | |

Burdís.

The portion of Upper Sind'h known as Burdíkar, from the tribe inhabiting it, extends in a north-easterly direction to the edge of the desert, and joins the Jat'húwí country to the S. The Burdís have among their subdivisions some notorious plunderers, who formerly infested the whole of Upper Sind'h, but have, since our establishment in that country, been much restrained. They are a numerous and warlike tribe, at deadly feud with the Mazáris and Búgtís, whose incursions, from their proximity to the hills and desert, they are constantly called upon to repel. Burdíkar is a productive tract of country, as the large outlet from the Indus called the Begári Nálá (stream) traverses its whole extent from E. to W., and affords full scope to irrigation. The principal town is J'hall, though the residence of the chief is Shír-gar'h. The subdivisions of the Burdí tribe are:—

- | | | |
|-------------------------|---|-----------------|
| 1. Bájárání (the Chief) | { | 1. Sálgaí |
| 2. Bungláni | | 2. Gólár |
| | | 3. Bangwah |
| | | 4. Raha-zayí |
| 3. G'hájání | { | 1. Shírá-zayí |
| 4. Kanírání | | 2. Kanderání |
| 5. Vindowání | | 3. Daíri-yání |
| 6. Báj-kání | | 4. Dáha-kání |
| | | 6. Sáhut-Kekání |
| 7. Bahal-kání | | |
| 8. Dahání | | |
| 9. Zápí | | |
| 10. Bakráni | | |
| 11. Chóhílání | | |
| 12. Jeg'hání | | |
| 13. Sundaráni | { | 1. Suháwí |
| 14. Súrání | | 2. Arbání |
| | | 3. Jágtrání. |

Of this tribe the four principal subdivisions, with their chiefs, are these :—

- | | |
|--------------|-------------------|
| 1. Bjárání | Shír Mahammed |
| 2. Sundaráni | Zefnata-l-dín |
| 3. Sorání | Khaíru-l-dín Khán |
| 4. Jeg'hání | Záhir Khán. |

And the three subdivisions above mentioned are again divided as described. The Burdis are subject to the Khaír-púr government, on the same conditions as the Khósahs and Jaṭ'húwís.

Jamálís.

This is a poor and small clan of Belúchís, who are cultivators and shepherds at Rájhán, at the northern extremity of Upper Sind'h, and on the edge of the Bárshúrí desert. They have also villages in Eastern Kach'hí, and were always on good terms with the Dumkis, Jekránis, and others who could not carry on their forays without the assistance of the wells kept by the Jamálís at Rájhán and other places. This tribe is tributary to the Kardár of Naushérá, belonging to the Haider-ábád government, and had the right of levying a toll on all Káfilahs and travellers passing the desert to Bárshúrí, as a sort of black mail for protection afforded to them across that tract. Their subdivisions are :—

- | | | |
|------------|--|-----------------|
| 1. Randání | \| | 3. Mundaráni |
| 2. Dasht * | \| | 4. Shírkánání.† |

* Desert.—F. S.

† Shír-Khánání ?—F. S.

EASTERN KACH'HÍ.

'Amránís.

The 'Amránís not being plunderers, but possessing in the lands near Mániyútí all they require for their sustenance and the pasture of their flocks, were constantly exposed to the violence of the marauders in their neighbourhood, and with difficulty maintained their position on the northern edge of the desert. They are an inconsiderable but well-disposed tribe, and have assisted materially in all our measures for putting down the Dumkís and Jekránís, with whom they were, of course, at deadly feud. Mániyútí and its vicinity have been before described; there are also portions of the tribe at Jam-bah and other places to the westward. Their subdivisions are:—

- | | |
|---------------|------------------|
| 1. Jangiyáni | 7. Palliyáni |
| 2. Barácháni | 8. Jangi Kházayí |
| 3. Ghazniyáni | 9. Sáziyí |
| 4. Ferózáni | 10. Rindáni |
| 5. Beláni | 11. Mazarání. |
| 6. Malgháni | |

Búgtís.

The Búgti Hills form the southern extremity of the range before mentioned in Eastern Kach'hí, and are entirely in the possession of this tribe, which is a large and powerful one, said to muster 2000 fighting men, though probably half that number would be nearer the truth. The Búgtís were a completely predatory tribe, being connected with the Mazáris, and affording shelter to the marauders in the plains. The capital of their country is the fort of Deírah (or as it is commonly called in the country Siyáf, from the spring near it): from its strong position it was considered as inaccessible by the native powers. The Búgtís thus carried on their system of depredation in perfect security; and the story goes, that the only attempt to punish them and the Máris ever made was, an expedition under the great Kelát chief, Naşír Khán, which failed completely. They have ever enjoyed a perfect immunity from tax or tribute; and a feudal acknowledgment of the authority of the Kelát chief was all they were called upon to pay. The only defile leading into the Búgti country ever passed by our forces, is that from Phuláji before mentioned. It is distant 64 miles, and is a perfectly practicable and comparatively open road for guns of any description. There are other footpaths to Deírah from the southern side at Matzín,

&c. Deīrah is situated in a fertile plain of about 6 miles in its greatest extent; it is a small and ill-defended fort, though the only stronghold possessed by the tribe; the siyáf, or spring, is distant about 400 yards. From Deīrah to Khán the distance is about 37 miles by a road practicable for guns (though they were transported with difficulty, having to pass through strong narrow defiles and gorges, particularly that of Pīr-pattah). The Búgtís are subdivided as follows:—their chief, Bebaḡaz,* is an old man, and has two sons, Ahmed Khán and Islám Khán.

- | | |
|---------------|----------------------|
| 1. Rájah | 9. Nótání Firúzdání |
| 2. Kalpars | 10. Nótání Dirisak † |
| 3. Masúrí | 11. Sandiyáni |
| 4. Kókání | 12. Rámá-zayí |
| 5. Mundarání | 13. Sarkarí |
| 6. Kiyá zayí | 14. P'hung |
| 7. Shambaiáni | 15. Chandrah-zayí. |
| 8. Seīdání | |

Of these the Kalpars, separating themselves from the other portions of the tribe who live in the hills, have always taken up their residence on the southern skirts towards Mallí, and thence have been most active and inveterate marauders in the Burdí country, as well as in the Haider-ábád districts, near Mubárik-púr, and the province of Chándúkí.

Máris.

The Mári hills lie N. of Phuláji, and extend nearly to the Paṭhan and Khajjak countries at Kwut and Mundaí. This tribe is certainly the most powerful and numerous of any of the Belúchí clans, and having a great reputation as warriors, as well as occupying a country so strong that a few determined men may hold the passes against a superior force, the Máris have ever been looked upon with great respect and terror throughout these countries. They divided with the Kákars the possession of the Bólán pass, and made continual forays on the whole of the low country inhabited by the people of Paṭan, northward of Lehrí. Mutual assistance tended to keep up an amicable feeling between them and the Khajjaks, who furnished a quota of their best men, to assist on occasions of hostility with other parties. The stronghold of the Máris is Kahán, a respectably-sized fort, situated in a well-watered and cultivated plain of about 7 miles in its greatest extent. Beyond this there are no fortified places, but two strong posts called Kódí and Kólú in the hills, where the whole tribe can be maintained with water and forage. These are about 40

* Very probably a corruption of Mubárik.—F. S.

† The Dirisakhs of Sir H. Pottinger's map.—F. S.

miles from Káhán. The climate of the Márf country is more bracing, and cooler by many degrees than that of the plains; rain is also very frequent. The appearance of the hill-tribes is indeed a stronger proof of the difference of climate between the lower and upper country than the height of these hills would seem to warrant.* A communication and considerable traffic is carried on between the Márf and Búgtí tribes and the Šik'h possessions in Harand-Dájil, in which direction, also, these marauders often commit depredations. The subdivisions of this tribe are:—

- | | |
|---------------|---------------|
| 1. Gazáñi | 10. Bálári |
| 2. Bijáráñi | 11. Kungaráñi |
| 3. Laharáñi | 12. Pomvádi |
| 4. Lálúwáñi | 13. Suluwáñi |
| 5. Siyál Kóat | 14. Shájú |
| 6. Mádigáñi | 15. Lóheráñi |
| 7. Bandáñi | 16. Shéráñi |
| 8. Rungáñi | 17. Mundáñi |
| 9. Sumráñi | |

The chief† is head of the 1st subdivision, and the other three influential men in the clan are Dalál Khán, La'l Khán, and Rahmat Khán. The Márf have jáhírs‡ near Haider-ábád and Khair-púr, and some branches of the latter family are connected with the chief by marriage, which increases the influence of the tribe.

Beyond the Márf hills, as it may be to the N., the following Paṭhan and Afghán tribes are settled, and they are also cultivators in the low country:—

Afghan Tribes.

- | | | |
|----------------|------------|------------|
| 1. Shádúz-rayi | 2. Shiráni | 3. Baidár. |
|----------------|------------|------------|

Paṭhans.

- | | |
|-------------|-----------|
| 4. Katriyás | 6. Pami |
| 5. Lúñi | 7. Daman. |

Dumkís.

This tribe is numerous, and thus subdivided:—

- | | |
|---------------------|----------------|
| 1. Míró-zaí (chief) | 9. Táláni |
| 2. Moḥammedáni | 10. Luwadh |
| 3. Brahmáni | 11. Siyúgháni |
| 4. Bághdár | 12. Gazyáni |
| 5. Shalkógi | 13. Haziráni |
| 6. Dimári | 14. Silúwi |
| 7. Gaugi | 15. Fatwáni. § |
| 8. Gaahkóri | |

* In 1840 the difference of the thermometer between Káhán and Phuláji was 25°; at the latter 122° within a tent being the maximum; and at the former only 97°.

† Since dead.

‡ Jáhír, i. e. feudal estates?—F. S.

§ Fat-pawáni?—F. S.

Jekránís.

This is not so numerous a tribe as the Dumkí, but its members were by far the most active plunderers of the low country. They acknowledge the authority of the Dumkí chief, and assisted that tribe in the expulsion of the Káihírís from Phulájí and Chattar, which last was the stronghold of the Gekránís; the most notorious of which clan as robbers were the chiefs Durgá Khán, Jámí, Rahmat, and Turk Alí, any one of whose names was alone sufficient to spread terror throughout the surrounding country, so that they carried on their depredations with perfect impunity as far southward and westward as Lárkhárah. The whole of Kach'hí was completely at their mercy, and no Káfilah was formerly safe without an escort of Dumkís and Jekránís; in other words, without a tax as black-mail paid to those tribes. The Jekránís mustered about 300 well-mounted men. They are thus subdivided:—

- | | |
|-------------------------|---------------|
| 1. Sáliváni (the chief) | 6. Sólkání |
| 2. Májání | 7. Mólkání |
| 3. Siyápáz | 8. Karór Kání |
| 4. Suwanání | 9. Dír Kání. |
| 5. Sudkání | |

The Jekránís now profess to cultivate the ground near Shírání and Sháh-púr; but there is too much reason to believe that they still carry on their depredations, though not openly. The natives of the country insist that no party of Belúchís on a chappáo [foray] can be complete without a certain portion of Jekránís as guides over the desert tracts which intervene* between Upper Sind'h and Kach'hí.

Káihírís.

The Káihírís are Sik'hs, and derive their origin from Afghánistán.† The sacred character of this tribe did not, however, as before mentioned, prevent their being molested by the Belúchís, and it is but lately that they have regained some of their lost possessions at Chattar‡ and its vicinity. During their exile from Eastern Kach'hí they lived under the

* I have always found the Jekránís the best guides in Kach'hí, even along the whole of the western and northern extremity of the province.

† In the history of Sind'h the following mention is made of this tribe in describing the country of Siwí, known as Sibi. "At the place called Chattar there is a tribe of Seyyads of Káihírí (which word is the name of a tree, the date-tree): the story goes that one of their predecessors by his knowledge of magic possessed the power of making a date-tree answer the purpose of a horse in transporting him from place to place." This childish legend is yet current, and believed by the Káihírís.

‡ The writer forgot that Sik'hs cannot be considered as possessing the character of sacredness, except among themselves; to Hindús and Mohammedans they are anything but sacred.—F. S.

protection of the Sind'h governments at Khair-púr in Upper Sind'h. The Kaíhírís are a strong tribe, and of the most peaceable habits, suitable to their religious profession; the violence of the Belúchís alone drove them to arms. They have not, of course, any subdivisions.

The foregoing enumeration embraces all the tribes met with between the Indus and the extremity of Eastern Kach'hí, and from thence to the Khajjak country. In the centre of the province there is also found the important Mag'hérí tribe under its chief Ghuláníl Nabí.* Their capital is Julál Khán, N.W. of B'hág. Their subdivisions are:—

- | | |
|---------------|------------|
| 1. Hájíz-zayí | 3. B'hónd |
| 2. Bambírání | 4. Arbání. |

The Mag'hérís have an offensive and defensive alliance with the Abrahms and Maghís. Beyond the Búgtí country to the E. and N., as far as Rózán on the Indus, we meet with the Mazárí Belúchís, a violent and predatory tribe, whose depredations have occasionally proved very injurious to the traffic on the river. They are subjects of the Sík'h government, but do not appear to be much restrained. The Mazáris join the Kalpar and Dirísak Búgtís in their forays on Upper Sind'h along the line of country extending from Kótriyá to Dádar. There are also Rind, Lashárí, and Jaṭ'húwí Belúchís. The Lasháris are a subdivision of the Maghís,† and are not very numerous. The latter have been before described. Independent of the Belúchí tribes in Kach'hí the Sarawan Bráhuwís are met with to the westward in the centre of the province, and northward in the vicinity of Dádar, Mitrí, Maghí, and Khajjak country, but they only reside in the plains during the cold months; of the Sarawan tribe who held jáhirs or lands under a feudal tenure in Kach'hí, or came down for food, &c. during the inclement season, were the Reissaní chief Ussud Khán, Shahwání Mahamed Khán, Bungalzeye, Adam Khán, Mahomedshye Mullah Deenae, Lehree, Mahamed Khán, Koord with Alla Deenae, Sungur, Zugar, Menghull Tazil Khán, and Roodeene.

* That is, "Slave of the Prophet;" a clear evidence of their religion.—F. S.

† The capital of the Maghís is Jhal, south of Gandárá, and their chief Ahmed Khán; they unite with the Jáláwán Bráhuwís for their mutual assistance. The Rinds are in the same position with respect to the Sáráwán Bráhuwís, and both are for that reason considered as belonging to those tribes, though they are in reality Belúchís.‡

‡ The Bráhuwís and Belúchís are different divisions of the same people, known under the general name of Belúch, or Belúchí: but their language and physiognomy indicate a difference of origin. The Bráhuwís are of a Hindú, the Belúches of a Persian race.—Pottinger, tom. v., p. 51.—F. S.

General Observations.

If we are to believe the accounts of the Belúchís established in Upper Sind'h and Kach'hí, one of their clans only originally emigrated from Makrán, viz., that of the Rinds, and those who lay claim to pure Belúchí blood say they belong to that clan. Of the time of this emigration there is no account. The pretensions to this origin, however, on the part of one clan are contradicted by those of another, though on no authority but tradition. The Maghsís, for instance, whose clans have numerous subdivisions, themselves also subdivided,* are said by the others to have no claim to any but a Jat, or Sind'hi origin, while the Dumkís, Sás'háris, and Rinds are declared by those who profess to settle the question, to be the only three of all the Belúchís entitled to call themselves Rinds. Some of the songs sung by the lúris, or bards, of the Belúchís touch upon these pretensions to purity of blood; and it is always a point of contention as to the right of a tribe to be designated "Asl" Belúchí.† The Rinds, the acknowledged head of all tribes, can now be scarcely considered as a distinct clan, having nothing beyond their title to support that degree of influence which they still possess. The Márís, though now powerful, are considered to have risen only of late years to importance, and are considered as having no claim to pure Belúchí blood. The same is the case with the Búgtís. Nothing satisfactory, however, could be deduced by pursuing these questions further, and we must trust to time and favourable opportunities hereafter for deriving, from a mass of contradictory and absurd traditions, something like a consistent account of the origin and separation of these tribes into the almost endless ramifications which they now present. This

* The capital of the Maghsí country is at Jhal, or J'hál, below the western hills, about 24 miles south of Gandává. It belongs to Kelát, and † may thus be considered as a portion of Kach'hí. The boundaries of the Maghsí country extend northwards, beyond Panjuk; westward, to the hills; southward, to Porykír; and eastward, to Abád. There are three subdivisions of the tribe at Shádázam (Pír Sákhán)—

1. Islání; chief, Shér Khán.
2. Kati; chief, Hágil Khán.
3. Husáiní; chief, Sa'íl Baksh.

And three at J'hál—

1. Shámháni; chief, Fatuh Khán.
2. Sakání; chief, Faíz Khán.
3. Rajjáb, chief, 'Alí Beg.

The Maghsís can raise a large force of well-mounted men, and are a formidable tribe; they muster, as before-mentioned, together with the J'hálwán, as well as the Maghíris, Abrahís, and other Jats.

† That is, a radical Belúchí.—F. S.

‡ Probably the author said, "But may be considered," &c., as Kelát is the capital of the Sáráwán division of Belúchistán, and more than 100 miles N.W. of J'hál.—F. S.

interminable system of clanship evidently sprang from the predatory and restless habits of these people themselves constantly giving birth to feuds, when parties were combining in distinct bodies for mutual protection. These feuds are handed down from generation to generation, and "blood for blood" is a law the Belúchí never forgets. If I except the Maghírís and the Maghsís, the Dúmkís, and Jekránís, all the other tribes are, more or less, constantly at feud with each other.

The Belúchís, who inhabit Upper Sind'h and Kach'hí, are a large muscular race of men, with very prominent features (some have a Jewish expression of face). Their custom of allowing the hair to grow over the shoulders and forehead, with a loosely-tied large turban and long beard, gives them a wild and ferocious appearance. They are Sanní Mohammedans; but, for the most part, completely ignorant even of the outward forms of their religion, the only object of their superstitious reverence being the holy character of a seyyad.* The tribes intermarry; but a Rind, like a Rájpút, will take a daughter from a tribe beneath him, though he will not give one.

The Belúchí has the very worst possible character among the other surrounding tribes; the foremost in the charges against him being his want of good faith. The oath of a Belúchí is considered as worthless, and is a by-word. They are also cowardly, vindictive, and cruel, combining the most wanton bloodshed with their chappáós (predatory expeditions).

There is in the Belúchí character an inherent love of lawless plunder and idle, dissipated habits. The country inhabited by this race is by no means deficient in all the essentials of fertility, and if properly cultivated, its resources, when turned to account, would sustain a far greater population than it at present maintains; but of the Belúchís, many tribes prefer their old system of reaping the crops sown by others, and trusting to plunder rather than labour in cultivating their fields. This system, under the former lax government of these countries, they could pursue with impunity; but it is to be hoped they may find it will be allowed no longer, and that the Jats and cultivators may meet with protection, and be encouraged to improve the country, and turn its great capabilities to account. Of these I would observe, that in Central Kach'hí irrigation could be carried on in any part of the province from the Nárí and its outlets. Eastwards the sinking of wells and forming tanks would provide a sufficiency of that

* That is one of the Prophet's family called Sherif in Africa and Western Asia.—F. S.

indispensable element; and westward, the running streams from the hills furnish an inexhaustible source of fertility to a large extent of country. Yet, with all these natural advantages, Kach'hí is thinly peopled, and generally uncultivated, arising principally from defects occasioned by the total absence of an effective system of government, which has so long prevailed, and consequently the want of any check to the lawless and predatory habits of the Belúchí tribes. Where the soil is cultivated, the crops are most abundant. The Khajjaks, for instance, have, alone perhaps of all the cultivators, been able to preserve what was their own; but this was done at the expense of making themselves the enemies of all around them; by force they, however, successfully resisted all encroachments, and had the only fertile portion of the province at their command. The waters of the Indus, as may be seen in the annexed sketch, at present reach to within a few miles of Rájhán, in Upper Sind'h, at their greatest extent north-westwards; but there is no reason to doubt that they might be carried across the desert to join the river Nárí in Kach'hí, and thus effect at once a complete change in the whole appearance of the country, all having been then done that is requisite to make a great portion of the present Desert-tract abundantly fertile. It will only be necessary to observe, that for want of canals and proper outlets the waters of the Indus, at and near Jáníderat, frequently inundate a large extent of country without being ever turned to any useful account—an evil arising from the jealousy of the native government, whose possessions to the eastward they conceive would suffer by the formation of canals; they, for that reason, resist any attempt on the part of the inhabitants to the westward to make an outlet for the inundations, and rather suffer the superfluous water to be wasted than to be removed from the land which it injures; but, if properly used, would fertilize. The cultivators of the country, however, are fully aware of the value of this great and permanent source of fertility which they possess in the waters of the Indus, but, under the miserable and short-sighted policy of such governments as have long had rule in these countries, the subject is powerless, and condemned to hopeless and irremediable indigence. Such are, unhappily, the most striking features in the condition of the labourers in Upper Sind'h and Kach'hí, where desert-tracts occupy the place of what, under a rational and beneficent government, would soon become fields, covered with abundant harvests.

XII.—*Account of the Ascent of the Kárún and Dizful Rivers and the Ab-í-Gargar Canal, to Shuster.* By Lieutenant W. B. SELBY, I. N., Commanding the H. C. Steam-vessel '*Assyria*,' belonging to the Euphrates Expedition, in the Months of March and April, 1842.

THE perfect navigation of the Kárún (ancient Eulæus) above Ahwáz (ancient Aginis), by steam-vessels, having always been considered, if not impossible, yet very doubtful, more particularly since the ascent as far only as Ahwáz, by the 'Euphrates' steamer, commanded by Major Estcourt, and a knowledge of the many and various benefits which a successful attempt to accomplish the ascent must ultimately confer on our mercantile labours and political relations, determined me, should an opportunity offer while yet in temporary command of a portion of the Euphrates expedition, to endeavour to ascend this river to its source, and, if possible, place beyond a doubt its practicability for all purposes, whether for the transport of troops or merchandize, or, which is even yet more essential, for the establishment of a moral and political influence in those regions, and in that part of Persia where, even now, England—its power, its wealth, and its greatness—are but so little known.

At the time that the opportunity for attempting the ascent of this important river presented itself, and for which for nearly a year I had been patiently waiting, the Mu'tamidu-d-daulah (confidential minister), the second functionary at the Persian court, and a man of great genius and power, was in the immediate vicinity of the southern part of it, engaged in suppressing the power of Sheik Thammar, the head of the large and powerful Chaab tribe, who by a more temperate government than is usually exercised by the rulers of that province, and a real desire to benefit his country, had succeeded in rendering it comparatively prosperous, and was perhaps approaching a state too independent for the wishes of the Persian court.

This, joined to his having afforded shelter to Mohammed Taqi Khán, a Bachtiyári chieftain, once of great power and influence, who had incurred the displeasure of the Persian court, formed the ostensible reason for visiting, and, consequent on such a visit, converting the quiet and fruitful plains of Rám Hormuz into barren deserts and burning villages, smouldering in the flames kindled by their ruthless invaders.

To understand why I have made mention of this high official, it will be well here to mention that he had hitherto invariably been opposed to our interests, and unequivocally used his

authority and influence against anything tending to an opening of the navigation of a river leading through so important a province of his master's dominions; and so strongly had this feeling been shown, that Captain Hennell, our resident and political agent at Bushire (Bú shehr), had, on a supposition that the ascent of this important river might be attempted by some one of the officers attached to the Euphrates expedition, written to the Bombay government, suggesting that an order emanating from them should be issued to prevent even the attempt. It may, therefore, well be imagined with what anxiety I commenced my undertaking, feeling primarily and most strongly that I might perhaps be acting contrary to the orders or wishes of the Bombay government, yet knowing, at the same time, that if I succeeded, very many important benefits must be secured to our interests, both in a political and commercial point of view; and secondly, that I would certainly have to combat the jealousy, if not the commands of the most powerful functionary in Persia, the country into which I was proceeding; and that, even if I surmounted these obstacles, I would still have to overcome another, and no inconsiderable one, in the "Bund of Ahwáz," which had already stopped the 'Euphrates' steamer in the proposed ascent of this river, and had always been supposed to bar the passage of vessels of any size; and had thus, until now, shut out the most important and fertile province of Persia, though traversed by so noble a stream, from the advantages of steam-navigation.

Deeply impressed with the necessity of avoiding all cause of discussion between the Persian court and our government, and aware of the importance of conciliating the high functionary just alluded to, I lent my best energies to the task, and was delighted to find by what subsequently happened, that I had completely succeeded in soothing that jealousy which had so long and strongly existed. Aware, then, of the difficulties I had volunteered to encounter, and feeling that a great degree of caution was necessary, I left Basrah in the latter part of February, 1842, to commence my undertaking.

I may here, perhaps, be allowed to express a hope that all obstacles of a political nature having been removed, and those of an artificial one successfully surmounted, and the free and perfect navigation of the river proved beyond a doubt to be practicable, the results may be such as will confer important benefits on our commercial enterprises.

The 'Euphrates' steam-vessel, while belonging to the expedition then commanded by Colonel Chesney, and under the immediate command of Major Estcourt, having ascended the

Kárún as far as Ahwáz in 1836, and a memoir and survey compiled by him having already been completed, together with one by myself, finished in May, 1841 (the time of my first ascent), also only as far as Ahwáz; and which I should imagine has long since been forwarded to the Honourable the Court of Directors, it will be unnecessary for me to recapitulate what he has already described, or comment upon subjects which he has doubtless ably explained. I shall, therefore, content myself with a general sketch of the river from Ahwáz to its junction at Mohammerah with the Shat-al-'Arab, or river of Baṣrah, and a more detailed account of it, as regards its course, its capabilities, the facilities for steam-navigation, and the more interesting parts of it as regards the country through which it passes from Ahwáz to its source, including the river of Dizful and the Āb-i-Gargar, or artificial canal, which is cut from the city of Shuster (on the Kárún, and close to the mountains), and after a course of about 40 miles, rejoins the river at Bund-i-Kír (Pitch-bar).

The Kárún communicated in two ways with the sea, by a direct and indirect channel.

The direct, the natural mouth and the one by which it formerly emptied itself into the sea, is by the Khór Bámushír, the next eastern of the mouths of the Euphrates to the Shat-al-'Arab (or Baṣrah river), and from which it is distant about 3 miles.

As a great doubt had existed regarding the practicability of this channel for the purposes of commercial navigation, a doubt which the Turkish authorities had always fostered, for reasons I shall presently mention, I determined to ascertain its real capabilities, and steamed down from Mohammerah to the sea and back, finding a channel of not less than 9 feet at low water. The reason why the opinion of its impracticability has always been fostered by the Turkish authorities will be evident, when it is borne in mind that the Khór Bámushír is strictly in the Persian dominions, being the natural outlet of the Kárún, one of its rivers; and consequently should vessels, in their intercourse with Mohammerah from India, Arabia, or other parts, use that channel, they would escape a heavy impost now laid on all vessels entering the Shat-al-'Arab; and much likewise of the trade now carried on with Baṣrah would be absorbed by Mohammerah, which already, notwithstanding the disadvantages it has laboured under, is fast eclipsing the other place.

The indirect channel is by the Haffár (or canal), an artificial cut, through which the Kárún now discharges the greater part of its waters into the Shat-al-'Arab, and thence into the sea.

Notwithstanding that Herodotus, in his able description of the Eulœus, now the Kárún, mentions and dwells upon this very work and triumph of art, some are still to be found who urge that it is a natural rather than an artificial cut, and use, as a principal argument, its magnitude. When, however, it is recollected that the Nahrawán, a canal from 120 to 130 yards broad, extended almost in a straight line from the river Zab to the sea, a distance of about 450 miles, and which still, though ages have passed, stands in solemn grandeur, filling the beholder with wonder, almost allied to awe, as he gazes on the remains of what once was so glorious a country—that immense canals, intersecting the Plain of Babylon, once connected the waters of the Euphrates with the Tigris—that the Āb-i-Gargar, a canal of nearly 50 miles in length, and in which there is now 12 feet water and perfectly navigable, and which, as being one of the means by which steam communication may be extended, I particularly directed my attention to, and shall consequently presently describe—when it is recollected that these were the works of the inhabitants of these then magnificent countries, this supposition will fall to the ground, and the form and name of this admirable work attest its origin.

The reason for cutting it is not so obvious, unless indeed to ensure water-carriage from Khúzistán, or Susiana, in Persia, to Baṣrah, Baghdád, and Southern Turkey, without going by sea from one river's mouth to the other, which, though it would now appear a work of immense magnitude, was, to a people who had all the resources of a vast and thickly populated country at command, but of secondary consideration.

The Haffár is about three-quarters of a mile in length, from 200 to 400 yards broad, and has a depth varying from 30 to 42 feet water.

On either side of the Haffár, half-way between the Shaṭ-al-'Arab and the Kárún, stands the present modern town of Moḥammerah, a possession of the Ch'ab Sheikh's, and governed by two members of his family.

Nothing can more forcibly show how little it avails a country to enjoy the greatest bounties of nature unless it be judiciously governed, than this very town, standing on the boundary between Persia and the Páshálik of Baghdád: to both powers it has, for some time past, been a bone of contention, and has by both been at times invaded; sacked by the latter some years since, and occupied by the former in November, 1841. Since the downfall of Sheikh Thammar (the head or chief of the Ch'ab tribe), Moḥammerah has suffered severely, and trade for a time has declined in consequence;

still, however, possessing as it does such natural and artificial advantages, it would, under a settled government, at once engross the whole trade now carried on by India, Arabia, and Africa, with Baghdád and Basrah.

From its admirable position, having the Kárún to the north-eastward, by which it communicates with the Persian fertile provinces of Khúzistán and the possessions of the Ch'ab Sheikh's; the Shat-al-'Arab to the north-westward, by which there is an uninterrupted communication with Basrah, Kórneh, Hillah, Baghdád, and in fact all the countries watered by the Euphrates and Tigris, and a passage to the sea by both the Kárún and Shat-al-'Arab; its merchants well informed, energetic, and enterprising men, and the people active, and much less bigoted than the Turks, the present possessors of Basrah, Mohammerah must ere long become, in a commercial point of view, the most important place on the rivers of Mesopotamia.

Besides the advantages which Mohammerah, considered either as a military post or commercial city, possesses, its great salubrity is of vast importance in a country so low and flat as the Delta of the Euphrates; and I am enabled, from a personal knowledge of it for some years, to bear witness to its superiority in this respect over any other part of the adjacent country—so much so, that when, during the hot months, duty called me from Baghdád to the town of Basrah or its vicinity, I invariably remained at or near Mohammerah, to which, in a great measure, I attribute the entire absence of that deadly fever which committed such havoc in the second expedition, under Captain Lynch, at its outset, and which can only be ascribed to its having been compelled to remain so long at Basrah. I may further adduce as a proof, that during the fifteen months I commanded the steamers 'Euphrates' and 'Assyria,' I only lost two men; one from an accident, the other in consequence of a chronic disease of seven years' standing: this latter was an artillery-man who joined the expedition from Bombay, and was immediately pronounced by the surgeon unfit for duty.

The salubrity of the one place, and the unhealthiness of the other, is entirely to be attributed to natural causes, yet, where these are baneful, they might easily be mitigated by a little energy and self-denial on the part of the rulers of Basrah, or rather the Páshá of Baghdád, for Basrah is in his Páshálik.

The one river (the Kárún)—rising, as it does, in the Bach-tiyári mountains, and fed only by the snow and rains which fall there and by the river of Dizful, also similarly supplied—loses, in its short passage (a transit of about 160 miles) none of that freshness and invigorating coolness, so different from the Shat-

al-'Arab, in which, in the month of August, I have myself, from personal observation, known the thermometer (Fahr.) immersed in the river, stand at 96°; while in the Kárún (the places of observation not 200 yards distant) I never found it above 80°. The cause is this:—The banks of the river Euphrates, about 60 miles above Basrah, are low, and unless these are attended to, and embankments made, previous to the waters rising in May and June, the country is overflowed, and a swamp, or indeed a fluvial lagoon, of miles in diameter, is formed close to Basrah. From this, during the intense heats of summer, a deadly miasma rises, and devastating fevers each year diminish the inhabitants of a city, which once was amongst the proudest of the East; and as population decreases, parts of the city become uninhabited, neglected, and at last ruinous: in June, 1842, it presented but a remnant of what it was, not farther back than 1835. To do all that lay in his power towards rectifying so deadly an evil, the Sheikh of the large and powerful tribe of Montefik offered, if one year's tribute were remitted him, to repair the banks, and maintain them; and, will it be credited? Ali Páshá, the sensual, apathetic governor of Baghdád, refused. Like all Turkish páshás, however, he looks only to the present gain, not the future or permanent prosperity of the country over which he is placed. From this swamp, therefore, arises this deadly miasma; and as the river begins to subside in August, the water from it (heated by four months' almost vertical sun, and of great power) runs into the river; thus causing its heat and consequent unhealthiness.

In the Kárún and at Mohammerah, on the contrary, a dry heat and rarified atmosphere is found, which is far healthier.

From Mohammerah to Ahwáz the general course of the river Kárún is N.N.E. and S.S.W., passing through a country tenanted by the Bawí and Idrís tribes, both subject to the Ch'ab. Two towns only are on the banks: one, Idrísiyah, a small fort and town on the left bank, a place of no trade or importance, and more a stronghold than an abiding place; the other, Isma'íliyah, commonly called Ismaili on the old charts, which carries on a little trade with Shuster and Mohammerah.

The banks are abundantly wooded, the Arabs civil and obliging, and no obstacle or obstruction is offered in the lowest season to a vessel drawing five feet water.

As this part of the river, however, was surveyed by Major Estcourt in the steamer 'Euphrates,' and as his survey has been already published, any description from me would be unnecessary, nor would it add anything to the extensive and valuable information then collected by him. The modern town of Ahwáz, built on the ruins of the ancient Aginis, is the

first town of any size or importance the traveller arrives at, journeying from Mohammerah to Shuster. A collection of hovels rather than houses, built of the stones which once formed a part of the city on whose site it now stands, a barren desert on every side, vestiges of canals which once irrigated and carried plenty through the whole of this then productive country, water-mills, formerly used to grind the corn and press the sugar-canes which the country abundantly produced, but now neglected and useless, are all that remain of this once great and important city; and the knowledge of the power and importance it possessed in former times, contrasted with the present wretched state of the place, caused me to view it with peculiar interest; I could hardly reconcile the idea that the silent and sandy desert I then trod once teemed with life and cultivation, and that the town on which I gazed was really all that remained to mark the spot where a city, great, opulent, and powerful, once stood.

It must not, however, be supposed that its present barrenness is to be attributed to the sterility of the soil; the climate is still the same; the same magnificent river still runs through it, and might be made to irrigate and cause it to produce most abundantly; it still presents, as it has done for ages, a safe, quick, and easy mode whereby our merchandize might be transported into these important provinces of the Persian empire; and should it be asked what obstacle opposes the immediate attainment of so desirable an object, I confidently reply, the form of government under which the country labours: vast provinces are farmed out to the great officers of state, who, seeking only their own immediate benefit, grind and oppress the inhabitants of the part committed to their care, and only intent upon amassing to themselves wealth, care nothing for the present or ultimate prosperity of the country.

Here the first range of hills between the mountains and the sea commences, extending in a W.N.W. and E.S.E. direction, and which the author of a late work has mistaken for ruins, and even goes so far as to say that they are so "immense as almost to rival some of the lowest of the Bachtiyári chain" (I quote from memory). Having, however, been to the summit of them for the purpose of making observations, &c., I can only wonder at so great a mistake having been made, and supposing, as indeed the Sheikh himself told me, that the writer had been unable to visit them, state that they consist of a range of sandstone hills from 100 to 400 feet high, and extend at intervals upwards of thirty miles.

They are, in the vicinity of the site of the ancient city, excavated to a great extent on the western side, where the face of

the hill is abrupt: these excavations were used as cemeteries, and in some of those which were difficult of access I found a quantity of human bones.

This range crosses the river in four distinct ledges, on one of which is built the famous "Bund of Ahwáz," which is the only obstruction that has hitherto prevented the perfect navigation of the river. The bund still bears strong evidence of the proficiency the inhabitants had attained in the art of building; the cement which has been used being more durable than the rock itself, of which it is built, as this has in many places worn away, while the cement stands out in relief.

There being no natural impediment to the perfect navigation of the river, it may be well here to describe the only artificial one which exists, and which has so long, because superficially viewed, been supposed to offer a complete obstacle to a further ascent. This, as will be imagined, is the famous "Bund" (or dam) of Ahwáz, which stopped the 'Euphrates' steamer in her projected ascent of this river in 1836, and which, when I first saw it, certainly appeared to present an almost insurmountable obstruction. On a close and personal examination, however, and by having a boat carried overland above the fall, and then dropping down with the current, sounding as I passed through, to be sure that no sunken rocks were in the channel, I felt convinced that, with only the appliances in common use among nautical men, I could with ease surmount it. My success on the first trial is the best proof that I was not mistaken. This bund or dam is, as it were, a wall built on one of the ridges of rock which here cross the river, for the purpose, when the country was formerly under cultivation, of keeping up the water to fill the canals for irrigation.

At the western end of it is an opening about 40 yards broad, and through this (with the exception of a portion of the water that finds its way over other small places, where the Bund now, by time, is worn or broken away) the whole of the river, here about 200 yards broad, rushes with a fall and velocity at first sight quite enough to induce the supposition that no steamer of 100 feet in length could be forced through it.

As I have however before said, I succeeded on the first attempt in overcoming it, and having thus practically demonstrated that it really is an obstacle of but little importance, trust that advantage may be taken of the knowledge thus obtained.

This examination of the Bund was at the time of my first visit to Ahwáz in June, 1841 (the lowest season), when I also made a trigonometrical survey of the river in its vicinity, and finding that a good channel not only existed through it,

but also through the other ridges of rock which here intersect the river, I determined, should an opportunity offer, to ascend the river to its source. I was at that time prevented in consequence of having to return to Baghdád, but cherishing my hope, I patiently waited until March, 1842, when I again found myself at Ahwáz, resolved that nothing short of impossibilities should bar my further progress. Of the salubrity of the climate it will only be necessary here to mention, that though the thermometer stood at 113° Fahr., under doubled awnings on board the steamer, I was constantly either in an open boat without awning of any kind, or travelling over the country, taking the necessary angles, &c. for my survey, without either any of my crew or myself being affected by the great heat.

Having thus prepared the way first by an examination of the obstacle itself, and secondly by propitiating the chief of the town, for he had at first shown great jealousy regarding my proceeding upwards, I on my second arrival, in March, 1842 (the highest season), at the scene of my former labours, at once pushed for the opening in the Bund. The whole power of steam was however unavailing, and twice was the vessel driven back. I succeeded, indeed, in getting to the crest of the fall, but to force a vessel over was beyond the power of the steam-vessel I then commanded.

Finding steam alone unavailing, I sent a large hawser or tow-line to the opposite bank, and by the application of tackle common to nautical men, succeeded in overcoming the current, and passed through the Bund, which, until then, had been supposed to offer an insurmountable obstacle to the perfect navigation of this river.

It may readily be imagined that it was with no small feeling of gratification I anchored near the town in sight of the spot, and within hearing of the roar of waters which marked the difficulty I had just overcome, and that my satisfaction was great at being the first who, in a steam or other vessel of 100 feet in length, had attempted and successfully achieved the passage of that which had hitherto been considered impossible, and hazardous even to the native boats which attempted it, and that I had thus opened the navigation of the most important river of Susiana. From hence I dispatched a messenger to the Mu'tamidu-d-daulah, and after communicating with the Sheikh, proceeded onwards. Leaving Ahwáz, and following the course of the river upwards, the country immediately in its vicinity is uninteresting, being a gravelly plain without any cultivation; nor has it on its banks any remarkable objects of ancient or modern history to interest the traveller; and at the

time I passed through, from the intestine disturbances of the country, but few Arabs were to be seen, and those only the Anáfiyah, a nomade tribe on the left, and some wandering Bawí, bent on plunder, on the right bank. Some idea of the inefficiency of the government of this now distracted country, and the lawless state into which, in consequence, the tribes have fallen, may be formed from the fact that the Bawí have been known to plunder almost up to the gates of Shuster, and the wild Bächtiyári to those of Teheran and Ispahan.

Pursuing a tolerably straight course to the north-eastward through a perfectly alluvial soil, and one capable of the highest cultivation, the next town we arrive at is Waís, in latitude $31^{\circ} 40' N.$, and 20 miles E. of Ahwáz: it is the first place of any importance between that town and Bund-i-Kír. It bears about $\frac{1}{2}$ N. E. from Ahwáz, and is 35 miles from it by the river, in a straight line 30, and is situated at the end of a long straight reach of about 10 miles, running almost directly S. from Bund-i-Kír. From the peculiar formation of the banks of the river in this reach, being very abrupt, and its perfectly straight course, I am very much inclined to suppose it to be a continuation of the original bed of the Ab-i-Gargar canal cut by Shápúr from Shuster, and which we read once ran to Ahwáz; and I am the more confirmed in this idea from seeing no remains of a canal which could be a continuation of that immense work, if in truth it was so continued, sufficiently large to warrant any other supposition.

N. 1 W. from Waís in latitude $31^{\circ} 49' 30'' N.$ stands the town of Bund-i-Kír, the ancient Asker Mokram, celebrated in former times as the site of a renowned city, and in the present as the spot where the three noble though neglected streams of Dizful, Shuster (Kárún), and Āb-i-Gargar unite, and well worthy, from its position as well as from a recollection of the rank it once held, of the pains which modern travellers have taken to describe it. As, however, the time at my disposal to ascend the three streams which here unite was limited, and as I felt convinced that a practical proof of the ease with which they might be navigated, and a trigonometrical survey of them and the adjacent country must prove highly beneficial, I devoted my whole energies to their examination, leaving to travellers who had preceded me (Colonel Chesney and Mr. Layard), and who had been enabled to direct their time and attention to this most interesting country, and whose labours have doubtless already been before the government, to describe those objects which belong more properly to the general traveller, than to one who like myself was necessarily confined almost exclusively to the river. Fearing also that I might

fail in that wherein they have so well succeeded, and that, were I to attempt it, I could not add anything essential to the knowledge of the country which they then, and I now, have traversed,—I shall confine myself to a few remarks, the results of personal examination and inquiry on the inhabitants, the rivers, and the country immediately bordering on these.

The river Kárún, the principal subject of the present memoir, rises in the Kúh-i-Zerd (yellow mountain), near Ispahan, and after traversing the valleys amongst the Bachtiyári mountains, finally emerges from the hills 3 miles N.E. of Shuster. Traversing that town it continues its course to the south-westward through the plains of Rám Hormuz, passing successively the towns of Bund-i-Kír (the junction of the river Dizful and Āb-i-Gargar), Waïs, and Ahwáz to the sea, in which it disembogues in the manner I have before described. It is perfectly easy of navigation at all seasons to vessels drawing 4 feet water, and admirably adapted for steam communication, as I shall subsequently point out, from the sea to within 6 miles of Shuster; but from this distance to the town the navigation would be difficult, from the rapid current here, about 5 miles an hour, and numerous pebbly banks which abound in the bed of the river between these points. From these causes, and from the loose gravelly nature of the soil in the bed of the river, great difficulties would present themselves to a vessel getting afloat again, should she accidentally be driven on a bank or shoal; and in the event of this river being ever used, I would not recommend that steam-vessels of the present construction should proceed higher up the river than the spot which I have particularly marked in the trigonometrical survey I was fortunately able to obtain. I shall show in the course of this memoir that for steam communication with Shuster the Āb-i-Gargar is the channel which will be found best adapted. From the point mentioned, however, the river presents no difficulty, but runs in an easy descent with a current of about 3 miles an hour to Bund-i-Kír, watering a country which might be made most productive, and one which from the nature of the soil, a rich alluvium, and close approximation of three streams. all easy of navigation, would amply repay the toil of the cultivator.

Tradition, indeed, has handed down the recollection of the time when this country which is now almost a desert, and which bears no mark of ever having been anything but the temporary residence of the wandering Arab, once teemed with happy villages and attendant cultivation, and strange as it may appear, from the extreme desolation which now presents itself to the view of the traveller, immense date-groves lined

the banks, and must have imparted a great idea of wealth and comfort to this, even yet, beautiful country.

Let it not be supposed, however, that the inhabitant of these regions, timid from constant alarms, and poor from as frequent spoliation, is yet totally ignorant or neglectful of the bounties which nature has bestowed upon him. The remains of ancient and existence of modern canals which completely intersect the country immediately to the southward of Shuster, attest that the iron despotism under which they live, and which we should suppose would cause them to become careless of everything, has not been able to prevent them in some measure from taking advantage of the blessings they so eminently possess. Favoured with a highly productive, almost spontaneously producing country, enjoying a healthy climate, which for nine months in the year is delightful, abundance of canals to convey the never-failing waters of the river to their fields, even now, in the iron days of their country, they reap, wherever they venture to sow, an abundant harvest. Contrary to the general rule, that adversity makes men selfish and morose, the Shusteris, oppressed by the government which should support them, viewed as aliens, almost as outcasts from the parent stock, their chiefs plundered and oppressed, their country ruined, and themselves and property at the disposal of any Persian official who may be sent into their country, still exhibit many noble traits of character, and exercise the most liberal hospitality, the greatest generosity, and the utmost attention to a stranger's wants that ever it was my fortune to witness. A town of Sayyads,* they are without exception the least bigoted of any Mohammedans I ever saw, and are totally different from the Persians, in whose territory they really are, and from whom they are partly descended, in not oppressing when they have the mastery, fawning when in your power, and begging at all times and from every one.

When I mention that at the time I was receiving the greatest attention from the authorities and people, the vessel was aground, and I in a measure helpless, and that I was hardly permitted to pay for workmen I employed and for date-trees cut and rafted down from above the rapids, a distance of 10 or 12 miles, and that the presents I almost forced upon them were most reluctantly accepted, those who know the character of the Asiatics most will best appreciate their conduct.

In writing thus highly of the Shusteris, I fear I may be considered as having drawn too highly coloured and flattering a picture. Let future experience and knowledge of them decide the point, nor, until they are found unworthy of the cha-

* Or Sherifs, i. e. Descendants of the Prophet.—P. S.

rafter I have given of them, and which, I am glad to find, is similar to the opinion which that indefatigable traveller Mr. Layard has formed, let them be classed with their oppressive neighbours the Persians.

This short but just tribute to these people, who treated not only myself but my crew with the greatest hospitality and kindness, though contrary to the determination I had formed to confine myself to a description of the rivers and other matters more within my province, will, I trust, be considered, although a digression, yet an act of justice on my part. One thing, however, has been learnt, and should be borne in mind, that from their evident leaning to the English, and wish to court their protection, as indeed expressed to me by some of their most influential chiefs; the exertions they made to open a correspondence with and obtain the countenance of our late Resident at Khárej; their hatred of the Persians, who have well, by their tyranny, oppression, and exactions, earned it; the proximity of Shuster to India, which, thanks to steam, can now be made at any season a passage of at most 18 days; the great facility offered for steam-navigation by vast quantities of wood admirably adapted for fuel all along the banks; the vicinity of all the tribes on the banks; the successful opening of the navigation of the river, which must greatly have tended to give them a favourable idea of our resources, and ourselves a consequent increase of moral power, all combine to point out Shuster as a spot which should be viewed with peculiar interest by us, whether for the advantages of mercantile communication, or in the event of a war with Persia; for from this point we might not only supply Khúzistán, one of her finest provinces, but pour an unlimited force into the heart of the country.

Naturally strong, completely insulated, and capable of being rendered almost impregnable, with no obstruction to our water-communication with India, Shuster might in our possession become of the greatest importance to us both in a military and political point of view, if ever the time should come, which I trust is far distant, when we shall be at variance with Persia.

Shuster, in latitude 32° N., and 10 miles E. of Bund-i-Kír, is situated on the river Kárún, at the foot of the Kuh-i-Fedekakh, (?) a remarkable hill forming part of the Bachtiyári range of mountains, in the north-eastern part of the province of Khúzistán. The town is built on a small hill, which, rising gradually from the south-westward, increases in elevation to the citadel, which presents, on the north-eastern side, an abrupt face of about 150 feet in length, having the river immediately

beneath it. There are at present about 8000 inhabitants, nearly all Sayyads, and though Sheikhs, not at all bigoted. The place is entirely built of stone, and though not wholly recovered from the effects of the plague which nearly depopulated it about six years ago, and from a flood which occurred in 1840, still possesses many buildings remarkable for their elegance. Like all towns in the East the streets are remarkably narrow, and showed in a strong and fearful light the ravages the plague must have made, as at each footstep the carved stone marks the spot where numberless victims to that scourge lie buried.

Having the river on two sides, and on the others a wet ditch, which might easily be put in order, the place itself, naturally strong from its position, might be rendered sufficiently so to resist any other than a well-appointed European force. May we, however, should we in future have any intercourse with Shuster, know it only as the emporium of a large part of the commerce of Persia, and as the road whereby our merchandize may find its way into that country!

It may appear strange that feudalism should exist in this apparently insignificant part of Persia; but so it is, and each Mahullah, or quarter of the town, owns its own separate chieftain, whose followers are ever ready to rally round his standard, whether for intestine or foreign warfare. The people appear to be perfectly happy under this form of government, and regard their chiefs more as the heads of families than as those who have the power of life and death over them. Of a race between the Persian and the Arab, they combine the polish of the one with the frankness of the other, nor did I ever, in any country, meet greater hospitality than was shown me by these people.

The whole town itself is, as I have before stated, under the Persian government, and being in a remote nook, and separated in a manner by the mountains from the rest of Persia, has always been viewed with much jealousy; that government knowing that opportunity alone is wanting to induce them to throw off the yoke now so grievously laid on them, and join the discontented tribes of Ch'ab and Bachtiyári.

The revenues of the province of which it forms a part are given by the Shah of Persia to the Mu'tamidu-d-daulah, who, besides collecting to the utmost that which is his due, takes frequent opportunities of making a visit to and sweeping the country of everything. It was during the time that I was in the country that one of these visitations occurred, and the scene of desolation, spoliation, and misery defies description: those only can properly understand it who have visited a country or place doomed by the Persians to such an infliction.

I shall here mention one or two incidents which occurred during my stay, and to which I was an eye-witness, which will give some idea of the oppressive way in which power is exercised by the Persian authorities, and also of the passive, almost stolid indifference with which it is submitted to; the result doubtless of long-continued and heart-breaking oppressions.

It will be borne in mind that in a previous part of this memoir I mentioned, that a very high officer of state (the Mu'tamidu-d-daulah) was in the vicinity of Shuster, on his return from Feljiyah (the principal town belonging to the Ch'ab Sheikh) to Ispahan. After having received from the chiefs of Shuster immense, and in some instances to them perfectly ruinous, presents of money, horses, and other valuables, he, one morning, shortly before finally quitting the place, sent for one of the chiefs of the town and informed him that he intended to farm out to him the tract of country lying between the river Kárún and the Āb-i-Gargar canal. This was remonstrated against in the strongest terms, as the chief had been already nearly ruined; and the sum required was about twice as much as he could ever hope to reap from the possessions thus forced upon him. Remonstrances however were unavailing, and 2 years' rent in advance was demanded within three days. Knowing that opposition to the Mu'tamid's will would only draw down upon himself and family much greater evils, and would be of no avail, the sum was made up and paid within the time; when, in a few days more, the Mu'tamid demanded and succeeded in forcing from him a third year's rent, and the poor fellow was so crippled in consequence, that part of his very household furniture had to be parted with to make up the sum, and he whose mansion was formerly thronged with retainers, and whose stables were filled with the choicest Arab horses, was reduced to comparative poverty: still, however, his people respected and regarded him as before, and though the vast reception hall was almost denuded of its furniture, still every evening saw it garnished with a repast for some forty or fifty of his immediate poorer kinsmen, at many of which I attended, and not only experienced from himself and family the same dignified attention, but from his kinsmen the same respect, although they must have known that I was in their country on friendly terms with, and ostensibly to visit, the Mu'tamid himself. Again, an officer of the Mu'tamid's took up his abode, by the invitation of its owner, in a house belonging to another chief, who not only found a separate table for his guest and followers, but, on provender becoming rather scarce, was told that as long as the green corn was standing in

his fields, *his* horses must not want. The corn was consequently used as provender; and to sum up, not only did he on his departure take all the furniture of every room he had occupied, but even the very cooking utensils which had been used. Many other and more gross instances I might mention, which would, however, answer no purpose, and only unnecessarily occupy time; I shall therefore leave to others to imagine what must be the feelings of the people on whom these outrages are perpetrated, towards those who inflict them. It is the recurrence of these and similar scenes, and the conviction that they have no security for their property, which prevent the merchant from trading, the husbandman from improving the land, and the artizan from extending his trade, as they know not at what hour they may be robbed of everything they possess.

The country about Shuster produces grain of all descriptions in abundance, and the people only require encouragement, and a feeling of security, to export opium, wool, cotton, and flax, all of which can be abundantly produced.

It would import in return sugars, hardware, cutlery, chintzes, cottons, and woollens, nearly all of which are now supplied by Russia, notwithstanding the tedious land-carriage to which merchandize coming from that country into the southern parts of Persia must be subjected. I shall, however, refer to this subject in a subsequent part of this memoir.

Little trade is at present carried on by Shuster, its principal imports being tea and other Russian articles from Ispahan, and dates, rice, and a few English articles from Basrah. Many efforts have indeed been made by some spirited inhabitants of Shuster and the vicinity to commence a trade on a larger scale than is now carried on; but, checked by the discountenance of the Persian authorities, their efforts have been abortive, and their desire to better themselves and country has been met with a studied indifference in their rulers, whose aim has ever been to prevent Shuster from rising to that importance which its situation and natural advantages justly entitle it to hold.

Close to the hills, by which the inhabitants may enjoy any temperature, the parching heat of summer alleviated by the snow which is procured in profusion throughout the year, watered on all sides by the river and canals, numerous extensive gardens close around, Shuster presents a most pleasing appearance, and might, from the natural advantages it possesses, soon be held in that estimation it was formerly, and become one of the first commercial towns in the southern part of Persia.

The water-works, for which Shuster is so justly celebrated,

consist of a number of water-mills cut through the solid rock, and worked by the water which is admitted from the river to fill the *Āb-i-Gargar* canal, a work which vies in magnitude and real utility with any undertaking of the kind, whether ancient or modern.

It runs through the town, or rather between the town and suburbs; and as this is built on a hill, the substratum, which is sandstone rock, has been cut through a depth of about 100 feet to bring the bed of the canal on a level with that of the river, where the two again unite at *Bund-i-Kir*.

Unless destroyed by some convulsion of nature, it will endure as long as the world lasts, and will for ever commemorate the reign of *Shápúr*, under whom it was undertaken and completed.

Over the main river opposite the town is the bridge, consisting of nine arches, and built entirely of stone; and that some idea of its strength may be formed, I need only mention that, situated as it is at the very foot of the hills, the river, from heavy falls of rain and snow melting on the mountains, has been known to rise 30 feet in one night, converting the stream into a torrent, yet has this bridge stood for years until the spring of 1842, when, in an extraordinary flood, it remained completely under water for two days, and on the river subsiding a part of the structure was found to have yielded to the immense pressure which it had had to sustain.

It is erected on a bund or dam, thrown across the river, consisting of blocks of stone from 15 to 25 feet long: to accomplish this work the whole river was turned into the *Āb-i-Gargar*, leaving the bed of the river dry. The bund answers two purposes, viz. that of giving a solid foundation for the bridge, and keeping the river always sufficiently high to fill the *Āb-i-Gargar* and other canals on which the fertility of the country depends.

I cannot quit the subject of *Shuster* without adverting to the extraordinary cheapness of articles of food, and which of itself tends to show of what the country is capable. On my first arrival I purchased live sheep, the carcasses of which when killed weighed from 25 to 30 lbs., at from 3*s.* to 4*s.*, and this although they were brought a distance of 6 miles. Bread of wheat-flour, 20 lbs. for a shilling, and vegetables for almost anything I chose to give, and this too at a time when they were suffering from the extortions of the Persian troops, the force commanded by the *Mu'tamidu-d-daulah* being then in the vicinity of *Shuster*, *en route* from *Feljiyah* to *Ispahan*.

Before concluding these few remarks on *Shuster*, its vicinity, and inhabitants, it may be well, having once or twice alluded

to the "Bachtiyári," to attempt some faint description of them, especially as they border so closely upon Shuster, and have of late been much mixed up with its inhabitants.

From having, however, been enabled to see but little of this most interesting region, and from that indefatigable traveller Mr. Layard, whose forbearance, aptitude, and amiability of disposition well entitled him to succeed in an undertaking of so much danger, having succeeded in traversing nearly the whole of their wild, beautiful, and mountainous country, I feel that I should be trespassing on dangerous grounds, were I to enter too fully upon a description of them, their manners and customs, and abodes. Unappalled by the dangers to which he was aware he was subjecting himself, nor dismayed by the untimely fate of two late English travellers, who had attempted to pass through part of the country, Mr. Layard boldly attempted this arduous and highly dangerous task, and after some most perilous adventures and narrow escapes from almost certain death, has fully succeeded in collecting much and valuable information; and what is even more important, establishing a good feeling between these mountaineers and ourselves.

It is from his pen therefore that their history and mode of life, together with the statistics of their country, must be learnt. I cannot, however, omit noticing them, their character having struck me as being so superior to that of the generality of Asiatics, and savouring so much of that chivalric spirit once so cherished by ourselves.

The mountain tribes of Bachtiyári, the inhabitants of that stupendous range of mountains which traverses the western parts of Persia, and are known by the same name, are the lineal descendants of those unconquered tribes who, often beaten but never subdued, at last succeeded in cutting off the Roman army sent against them, the corpses of which fed the wolves, and their bones whitened the desert, the inheritance of those they might overpower, but never conquer. When viewing one of those free and noble mountaineers, armed and mounted for the fight, the deadly matchlock taking the place of the now almost rejected bow, but little stretch of imagination is required to fancy that you have before you one of those heroes and patriots, who, in spite of the power and terror which the Roman legion carried with it, deluged the sands with the blood of Crassus and his invading army.

Renowned as they then were for their unrivalled use of the bow, and for being able in full flight to take deadly aim at their pursuer, that and all other feats of horsemanship fall far short of what I have seen done by a modern Bachtiyári, and

which is not considered amongst them as anything extraordinary. A mounted horseman, armed with mace, sword, three pistols, and matchlock slung across his back, will put his horse off at full gallop, then flinging behind him his felt skull-cap, will unsling his matchlock, and turning round on the saddle, the horse still at full gallop, fire, and almost always strike the object. Their admirable horsemanship, the perfection of training to which they subject their horses, together with the perfect command they have of all their arms, their being able, either in approaching or retreating, to lay themselves along the horse's side, render them the most efficient light cavalry in the world for acting independently, and this is allowed by military men who have had an opportunity of witnessing their evolutions.

It is likewise gratifying to us to know that these mountaineers, who have so long been considered barbarous and inimical to Europeans, have been greatly belied, as they treated Mr. Layard as they doubtless would any other European, who could and would free himself from the prejudice so common to those who consider themselves first in the scale of nations, in the most hospitable and kind manner, and Moḥammed Taḳi Khán, one of their most powerful chiefs, made many an earnest offer to him. Having had the pleasure of seeing this celebrated chieftain, it will not, I hope, be considered irrelevant if I shortly notice one or two acts of his, more consonant with the greatest philanthropy than with the cruel and blood-thirsty disposition which has been ascribed to these people.

Some time ago an English adventurer who had been in his service, was entrusted by him, without security of any kind, with a vessel laden with the produce of his country, that by conveying it to Basrah a trade might be encouraged between it and Shuster. Unfortunately for the success of the experiment, the boat and crew were totally lost, and before another attempt could be made an event happened which I shall presently relate, and which I fear has for ever crushed that generous chief.

Again, his treatment of Mr. Layard, of whom he could have known nothing, coming as he did without even an attendant, and his subsequent offers to him, were of almost princely munificence.

All his actions are described as being most just, and the country enjoyed more security and repose under him than had been known for many years previous. He consequently rose to great power, and would soon have been enabled to throw off, had he wished, the Persian yoke.

This state of things, however, militated too much against

Persian policy, and the Mu'tamidu-d-daulah came down determined to get possession of his person at all hazards. Secure in his inaccessible strongholds, he laughed at the attempt, and might have remained while he lived, free and unharmed; but lured by the most sacred oaths of the Mu'tamid himself, and of an officer high in the service and even a mulla, who bore to him a Koran on which the Mu'tamid had sworn that, if he would visit his camp to discuss the matter amicably, he should return in safety, he consented, contrary to the advice of all his friends, to an interview, and left his castle with only a few attendants, and sought the tent of one who regarded neither oaths nor treaties, nor even the dictates of honour when they interfered with his wishes. Immediately on entering the tent he was seized; and when I last saw him was lingering out, to one of his noble spirit, a miserable existence in chains. With these few words I conclude my sketch of these mountaineers, who appear worthy of a higher place in our estimation than they have yet held.

Between the first range of hills under which the town is situated, and the second or next eastern, where the river first emerges from the mountains, is the plain or valley of Akkille (Ak Kal'eh?), watered by the river which passes through it, and numerous canals, and presenting, as far as the eye can reach, one vast corn-field, studded with villages and date-groves, and numerous gardens, amongst which the orange is most abundant.

There also are the remains of a very large canal leading from the river close to the second range of hills, and which, though centuries must have passed since it was made, for no memorial of the time of its construction exists, is even now above 80 yards broad. This I am informed once ran through the plain to the eastward of the river, and was in fact the main artery whence the lesser canals received their supply. Modern canals of great extent, and in good repair, with which the whole plain is intersected, serve now to irrigate the country, and assist nature in rendering this one of the most fertile spots in the whole province.

This valley is about 40 miles long, and from 10 to 15 broad, and from its position, receiving all the rich soil washed down from the mountains, necessarily most productive; and it is from here that Shuster, and a vast extent of adjacent country, are supplied with corn of all descriptions.

To reach this place from the town, the pass winds round and along the eastern face of the gorge, from which the river finally emerges from the hills into the low country, and which is here about 100 yards broad, unfordable, and has a very rapid current. The side of the mountain round which the pass winds is very

precipitous, and the path itself barely passable for loaded animals. To one therefore who like myself had for so long been used to the sterile and sandy wastes of the Mesopotamian desert, the scene, as we mounted the pass and looked down upon the fruitful valley before us, was truly interesting, and I may therefore be allowed to describe it. Frowning precipices over head, which seemed as though the slightest breath of wind would dislodge them from their places, the pass winding now round, now under them, a sheer descent of from 300 to 500 feet down to the foaming torrent below, the solitude only broken by the sullen dash of the waters against the rugged base of the cliffs, and the vast masses of rock which the hand of time had loosened from the mountains; the distant view of the plain beyond, where quiet villages and teeming corn-fields offered such a contrast to the scene of desolation we were then treading, made this spot one of the most beautiful I had ever beheld; and I felt that toleration and civilization alone were wanting to make it one of those which would best repay any toil of the husbandman.

The gorge at the second range of hills where the river emerges into this valley is a remarkable one, and has an apt tradition annexed to it.

On either side of the gorge, on the very precipice itself, are the remains of two castles, the one called Kāl'eh Rústam, the other Kāl'eh Dokhter, about which there is the same tale that is told of so many places of a similar description, and which is so frequent among Asiatics.

A lover, separated by the envious waters from his mistress, and whose passion daily urges him to dare the foaming torrent, is the tradition of these two certainly remarkable hill-forts. That they were the erection of some veteran soldier is most probable, as they entirely command the pass from the low to the high country, and must have been, at the time they were built, impregnable.

Even here, in the very mountains themselves, the river is not fordable, nor could I perceive any obstruction that a well-found and powerful steamer might not overcome. I would not, however, be understood by this remark to recommend the attempt, as no sufficient inducement could be held out to warrant the expense of such an undertaking; nor would any material benefit be derived, or any other end gained, unless indeed the proud satisfaction of knowing that our steamers had passed from Baṣrah to Bális on the one hand, and from the sea to the Bahtiyári mountains in Persia on the other, thus completely opening the navigation of the Susianian rivers;

and that the most friendly feelings had been encouraged and maintained in those regions.

Having thus attempted, faintly, I fear, to describe Shuster, its inhabitants, and the incidents which most drew my attention, together with the advantages which a communication with it presents, I must for ever regret that pressing duty, and consequently imperious necessity, confined me to the vessel and river, when my inclinations would much rather have led me to extend my researches into the highly interesting country on its banks: to visit the natives from the khán to the felláh, from the prince to the husbandman, as one of themselves, and thus enlarge my knowledge of those who certainly commanded my esteem and respect, and whose every offer of aid and assistance, sincere too from having been tested at a time when they must have viewed my arrival with peculiar jealousy (from being the first English vessel ever in their waters), was made and fulfilled with a frankness and evident desire to serve, that I could not have expected from Sheikhs and Sayyads to a Christian.

That much of this good feeling on their part is owing to the high character a late English traveller bears among them, I cannot doubt; and should it ever be the wish of our government to establish an intercourse with these people, Mr. Layard's efforts will not have been thrown away, as I am convinced they entertain a most favourable opinion of the English character, from having seen the kindly sentiments with which they regard him, and the way in which I, as an English officer, was received by them.

Second as an offset from the main stream, though worthy of holding the first place from its real importance, is the *Ab-i-Gargar*, or artificial canal cut by Shápúr, which, leaving the main river at Shuster, and pursuing a south-easterly course, re-unites with it at *Bund-i-Kír*, where is also the confluence of the *Dizful*.

Tradition reports that it anciently ran to *Ahwáz*: whether or not it did so, I must leave to others to decide. I am, however, led to suppose that *Bund-i-Kír* was not anciently its termination, for as I have before mentioned, the long straight reach from that place to *Wáís* bears a much greater resemblance to an artificial than to a natural channel.

It is much better adapted for steam-navigation than the main stream, as in it the current is less, and Shuster itself can be approached nearer by 3 miles than by the river.

The canal itself, which, I have before observed, leaves, or rather is cut from the *Kárún* at Shuster, runs to the southward

and eastward, and finally to the south-westward, for a distance of about 40 miles, through a beautiful and highly productive alluvial plain or valley, in some places a mile, in others more than a mile wide. Like all streams running through a similar soil, it is rather serpentine, and winds from side to side of the valley, thus traversing and completely watering the whole of it. This valley is bounded by steep marl cliffs, which are in fact the banks that formerly restrained the waters in their course, when the whole river was turned into this channel while the bridge was being built. The sketch, however, which accompanies this memoir will better explain what it really now is.*

Continuing the course to S.W., these high cliffs gradually approximate, until, at the junction of the canal with the other rivers at Bund-i-Kīr, they form the immediate banks and tower perpendicularly over head to a length (height?) of 130 feet.

The depth of water in the Āb-i-Gargar is nearly uniform, being, in the channel, from 12 to 18 feet in the lowest season; the breadth varies from 60 to 120 yards, with a current of not more than 2 miles an hour, until after passing the town of Khasāmābād, when as it approaches the hills the current gradually increases, until at about 2 miles from Shuster it runs at the rate of about 5 miles an hour. At Khasāmābād trading-boats to and from Shuster load and unload, their cargoes being conveyed across by land-carriage.

To ascertain beyond a doubt how far the canal was capable of being navigated by the steamer I then commanded, I ran on until within 1 mile of the town, where the passage was finally closed to me by a natural ledge of rocks reaching right across the river, with only a small opening about 10 yards wide, through which, however, boats of 20 tons can and do pass into the very heart of the town; and thus might we either land troops, or our merchants their goods, from either England or India, in the very heart of the town; the advantages of which, especially in a country where land-carriage is so expensive and precarious, are too evident to require comment.

Half a mile above the point to which I attained is an artificial bund or dam, on which are the remains of numerous water-mills; these, however, could only have been used when the whole river ran through the canal, as they are now many feet above the present level of the water. Good wood for steaming is plentiful along the banks and on the small islands in the

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centre of the stream; but as the distance between Bund-i-Kír and Shuster is so short (only about 8 hours), no intermediate wooding station would be necessary.

Little known, and less used than either the Kárún or Āb-i-Gargar, is the river of Dizful, a stream which only requires opportunity to be made as useful as either of the two with which it unites at Bund-i-Kír: it is extremely tortuous, and has consequently little current; wood abounds all along the banks, which are inhabited by the large and powerful tribes of Análiyah and Al Hádhar, extremely well disposed towards us. This river, leading through so fertile and important a part of Persia, presents great encouragement and facilities for steam navigation, the results of which would be most beneficial; and now that I have both seen and traversed these rivers, and know their capabilities, it is a source of extreme wonder and surprise to me that they, being as it were the high road into the very heart of that part of Persia with which we now take such a roundabout method of trading, should so long have been neglected, and that we should have so quietly shut our eyes to their vast importance. Russia, though struggling with a tedious land-carriage, supplies the markets of this province with European articles; which we could much more easily do by water at once from England or our colonies.

A commercial treaty entered into with Persia, our steamers running on the rivers of Mesopotamia, those rivers strictly in the Persian dominions, and having been easily and safely traversed by a vessel possessing much less capabilities for river navigation than the boats which are now built for that purpose, what prevents us, I would ask, from commencing that intercourse with the inhabitants which their advancement in civilization and our own interests so imperatively demand?

An extremely healthy and productive region, friendly tribes on the banks of the rivers, the country fertile in objects of interest both to the merchant and geographer, our present political relations with Persia considered, all tend to point out these rivers as the means whereby we may not only increase our political power, but our commercial advantages; for so long as we can, as we now do, entirely command the access to these rivers, our perfect and easy navigation of them will ever be considered by both the authorities and the people.

I exceedingly lament that an unavoidable detention of a month longer at Shuster than I had anticipated prevented my reaching the town of Dizful, as the water had already begun to fall, and I feared, not having a previous knowledge of that river, that if I ascended higher, and were stopped by grounding or other accident, I might, should the river fall very low,

be detained throughout the year. I succeeded, however, in ascending with ease some miles above Kal'eh Bunder (Band-i-a?), which is not, I believe, more than 13 miles from Dizful. Up to the point I attained, and on which therefore I can with certainty speak, the river is remarkably good, having a channel of not less than 6 feet in the low season, with the banks abundantly wooded, and the neighbouring Arab tribes exceedingly well disposed towards us. They freely supplied me with provisions, and I found no difficulty in purchasing fire-wood for fuel from them at the same rate we were then paying on the Tigris, where our steamers had been running for many years.

From Bund-i-Kír to Kal'eh Bunder there are no obstructions in the river (more than are met with in all rivers running through an alluvial soil); shoal-spits running off the points, and in long reaches some shoal-patches, are all the difficulties, if they are to be called such, that exist.

At Kal'eh Bunder, an old fort on the right bank of the river, the country, which from Bund-i-Kír upwards is a level plain, becomes hilly, and here also is another, a natural bund. It is formed by a ridge of rocks running half-way across the river, and which at this place is narrowed also by an island. The current runs through at the rate of about 6 miles an hour, so that, formidable as I had been led to suppose it, I was truly gratified at finding the 'Assyria' steam through with perfect ease.

From hence, however, the current begins to run much stronger, the descent in the land being greater; a well-formed and powerful steamer, however, such a one for instance as Mr. John Laird, of Liverpool, has just built for the navigation of the Indus (by the direction of the Honourable the Court of Directors), would find no difficulty in running throughout the year, continuing through a beautiful country diversified with hill and valley, and evidently capable of high cultivation. A few miles further on is Abú Beshá, an old imaum or tomb, and about 5 miles beyond this is the point to which I attained, and from which with great reluctance I felt myself compelled to turn back.

Having attained to within 5 miles of Shuster by the Kárún, and within a mile of it by the Āb-i-Gargar, it may be imagined how anxious I was, by reaching Dizful by its stream, to complete the ascent and survey of these as yet unknown rivers. My regret, then, at having to give up this much-desired and almost attained object may be felt; and it will, I am sure, be acknowledged that nothing but a dread of compromising our government with the Persian authorities, should I be unavoidably detained a whole season in one of the rivers, determined me to surrender my much-cherished hope of completing to the

utmost what I am assured must ultimately be of so much benefit to us.

The river falling, being informed that a few miles further a-head it was fordable, knowing also that I had taken on my own responsibility the survey of these rivers, and that I should be unable, in the event of being detained in the river during the season, to show any order for my undertaking, altogether determined me, and I relinquished my attempt at a further ascent with very mingled feelings of joy and regret—joy at having done so much, and great regret at having been unable perfectly to complete the ascent and survey of these streams.

With these few remarks, then, I quit the subject of these rivers, feeling assured that the day is not far distant when they will be as well known and traversed as the Indus or the Ganges.

Rivers situated like those of the Kárún and Dizful, taking their rise from an immense mountainous tract like that which feeds them, and having no parasitical offshoots to absorb the supply, are throughout their whole course affected only by rains which fall in the mountains whence they rise; and as these are yearly covered with vast quantities of snow, and as periodical rains prevail from November until the end of April, that time may be considered as the high season.

These rivers do not, however, like the Euphrates and Tigris, rise to a certain height, and maintain it for a time, but, affected by heavy falls of rain, which assist to melt the snow, or by an interval of warm weather, they rise and fall irregularly many feet.

The highest rise in 1842 was in February, when the whole country was inundated, and the banks in the lower part of the river, which in June, 1841, were 12 feet above the level of the river, were, when I passed up the ensuing February, on a level with it. From the waters being materially restrained by the Bund at Ahwáz, and from having sounded above it in June (the lowest season), when I found from 9 to 15 feet water, the difference in depth cannot be, as far as I ascended the river, more than 6 feet; and I have, in the chart of the Trigonometrical Survey I obtained, put down less water than I really found in the channel.

It may, therefore, be assumed, from my own observations and the best information I could collect on this important subject, that these rivers are never fordable between the points I reached and the sea. The Āb-i-Gargar, in consequence of its supply coming from above the dam at Shuster, is but little affected by any rise in the main river, and is at all seasons navigable for vessels drawing six feet water.

Having now adverted to the points which most drew my attention, and endeavoured to point out some of the advantages which may result from the navigation of these rivers, and shown, I trust, that no natural obstacle exists, I would wish, in a few words, to sum up the advantages and facilities which they offer.

If any political movement is to be attempted in this quarter—if the spirit of discovery and research continue to actuate, as it ever has done, our government—if a material increase in our commercial relations with Persia is considered of moment—if the connection of ancient with modern history, in some of its most interesting points, still continue to hold out charms to the antiquarian and geographer, then is this country one of those which should be most particularly examined, and which would yield an abundant harvest.

Again, if it is still our wish to extend our commerce, whereby we exist, or our influence in those regions, the want of which we may perhaps ere this have felt, or our knowledge of the statistics of this most interesting country, these rivers present the means whereby all this may be accomplished.

Here we have neither hostile Arabs, rapid currents, nor shallow fords to contend with; but rivers, easy of navigation and abundantly wooded, offer every inducement.

Five days, including stoppages of all sorts, and having to cut my own fuel, against, too, a current stronger than was remembered for many years—five days sufficed to ascend the Kárún from Mohammerah to Shuster; and this, although I was detained ten hours, besides anchoring every evening about sunset.

This was by the main river; by the Āb-i-Gargar, with depôts of fuel laid, the ascent from Mohammerah to Shuster might be easily accomplished, by such vessels as the 'Assyria,' in three days; by such as are now built, in two and a half.

The whole of the banks of these rivers being so abundantly wooded, it is hardly necessary to name any particular points which might, in the event of the steamers running on these streams, be made depôts for fuel. As, however, there are some which, from their peculiar position, such as being the constant locality of the Arabs, or from other sufficient causes, are better adapted than others, I shall mention a few, the fitness of which peculiarly struck me.

Kal'eh Idrísíyah, a mud fort on the left bank of the river, the residence of Arabs of the Idrís tribe, and eighteen hours' steaming from Mohammerah, against the strongest current that ever runs in the river, appears to me well fitted for the first station. A steep bank, with deep water close by, and abun-

dance of tamarisk—the best wood for fuel possible—the people very civil and extremely willing to cut wood, are sufficient causes for this to be considered as well adapted.

Ahwáz, which of course would be a main depôt, is only 16 hours above Kal'eh Idrísíyah; here either coal, sent from Mohammerah, or wood, might be laid, though in its immediate vicinity there is none, nor any nearer than 9 miles. At this distance, however, there is abundance, which might be cut and laid at 6s. the 1000 lb., or one hour's consumption of the 'Assyria.'

From Ahwáz to Bund-i-Kír 10 hours, where an abundant supply may always be obtained, and whose people are remarkably civil.

As from hence to Shuster is only 9 or 10 hours by the main river, and 8 by the canal (Ab-i Gargar), depôts might be laid at any place along the banks. At Shuster itself, however, no wood for steaming could be obtained, that used by the inhabitants being very small and brought from the mountains, and not more than sufficient for their own consumption.

From Bund-i-Kír to Dizful the banks, with very few intermissions, are covered with wood. As, however, there are no villages on the banks until we arrive at Komát, and the Arabs who tenant the country are migratory, depôts of fuel might be cut and laid at any spot deemed most convenient; as from these people also I met with every attention and wish to assist me in everything.

If, then, I have shown that no physical difficulty presents itself in the navigation of these rivers, and that practice alone is required to perfect what I have commenced, I shall have accomplished that which I can only regret has not been attempted by some abler person than myself.

In conclusion I must observe, that should any one in after-times devote his attention to the same objects which I had in view, and find that in some description I am incorrect, or faulty in some omission, he will bear in mind that part of this river was surveyed in June, with the thermometer at 113° Fahrenheit in the shade; and that I had not one single assistant who could in any way aid me in either observations or calculations.

XIII.—*Narrative of M. MIDDENDORF's Journey in Northern Siberia.* Communicated by Admiral VON KRUSENSTERN, Hon. Mem. R.G.S. Translated by the Editor.

In the spring of 1843, M. Middendorf commenced his preparations for exploring a region almost wholly unknown, and the knowledge of which is most interesting to science on many accounts; and having now returned from his most enterprising and dangerous journey, he has addressed a report of his proceedings to the Academy of Sciences of St. Petersburg, from which, and from a memoir drawn up by Prof. K. E. Von Baer of the Imperial Academy, the following abstract has been made:—

By the 23rd of March, 1843, the intrepid traveller was prepared to leave Touroukhansk for the north; but before we accompany him in his perilous undertaking, it will be well to premise a word or two on the objects of his expedition, and on the motives which induced the Academy to prescribe to M. Middendorf the exploration of the regions to the north of Touroukhansk, and to proceed, either by the Piassina or the Khatanga rivers, to the shores of the Frozen Ocean.

All that vast region which extends, on the right bank of the Yénisséï, from the Lower TOUNGOUZKA to the sea coast, was almost unknown. Some notions, though perhaps not very exact, existed of the geographical conformation of the coast; but no one—no European at least—had yet penetrated into the interior of the country; and even the greater part of the sea coast had been visited only in the winter. The Empress Anne had sent different maritime expeditions. Thus, in 1735, Prontchistcheff, a lieutenant of the imperial navy, had started in a light vessel from the mouth of the Lena, and followed the coast westward to beyond the point where the Khatanga disembogues into the Frozen Ocean, without, however, having been able to double Cape Taimyr, although he reached 77° 29' N. latitude. Retracing his way back, on the approach of winter, he was unable to reach the Lena, and those who survived of his crew were compelled to winter near the mouth of the Olenek; the commander of the expedition, together with his wife, who accompanied him, had fallen victims to the rigour of the climate before this port was reached. The Admiralty, nevertheless, did not abandon the hope of being able, by similar expeditions, to obtain a complete knowledge of these inhospitable shores; and, in 1739, Lieut. Khariton Laptieff was despatched with instructions to direct his course from the mouth of the Lena towards Cape Taimyr. The first year this gallant sailor, overtaken, like his predecessor, by the bad season, was obliged to winter at the mouth of the Khatanga. The next year, hemmed in by the ice, he with difficulty escaped from his ship, which he was forced to abandon:

he remained, nevertheless, with admirable perseverance, in these dreadful deserts till 1743, occupied, together with his officers, whenever the ice and snow favoured their progress, in mapping the coast. The summer was passed at Touroukhansk, to which place they went by ascending the Khatanga. Even Cape Taimyr, the most northern point of the continent, was reached, as it appears, by one of Lapüeff's subalterns, without its having been possible, however, to fix its geographical position, the state of the atmosphere not admitting of astronomical observations. Another officer of the expedition, also in the winter, visited Lake Taimyr, to the west of the promontory of the same name. There ended the labours of these travellers. We are still without an accurate chart of the coast from Cape Taimyr, westward, as far as the mouth of the Piassina, and, until the exploration of M. Middendorf, absolutely nothing was known of the nature of the country in question: we had no knowledge of its climate or its productions; we were even totally ignorant of the latitude at which, in these regions, the forests terminate, and the degree at which nature ceases to produce isolated trees.

Nevertheless, it was important, in many respects, to have correct notions of the climate and natural productions of these regions. Thanks to the labours of Tréviranus, Humboldt, Ritter, and other philosophers, the researches into the influence of what may be designated the physical conditions of life in the development of organization, and its dispersion over the surface of the earth, have, in our days, given increased interest to the natural sciences.

An exact comparison of the soil and productions of various regions, situated under different latitudes, can alone furnish the means of extending our knowledge of this subject, and enlighten us on the means employed by nature to call into being organic life, to maintain it, and to develop it with greater or less energy. For a long period, Lapland, often visited since the time of Linnæus, had been considered as representing unity, or the starting-point, if we may so express ourselves, in the scale of such comparisons. More lately, however, regions still more sterile and situated under much higher latitudes have been explored—thanks more especially to the perseverance of the English; yet little beyond the shores of these countries have been subjected to scientific examination. Never until now has it been possible to explore the interior of any great continent extending further north than Lapland. Notwithstanding this, the progress which has recently been made in the study of climatology has made us acquainted with the influence of the neighbourhood of the sea, and of the relative position of the land with regard to it, as forming its eastern or western boundary.

In order to that bringing together of fact which is contemplated

by science, and to establish a more solid basis of comparison—to determine a state of nature which may be regarded as unity, in the sense previously alluded to—it appeared necessary to explore the interior of the continent in that part of it where it extends farthest to the north, without being exposed to the influence of the vicinity of the sea. These conditions were presented by the region on the right bank of the Yénisséï, beyond the Lower Toungouzka—the region, in fact, which M. Middendorf was instructed by the Academy to penetrate.

The task imposed upon this traveller was so much the more difficult, as he would have to traverse the deserts in summer, in order to study their nature and their productions. In winter, provisions may be kept a long time without spoiling; and, provided there be a sufficient number of draught cattle, it is easy to transport upon sledges a large quantity of them, and of the wood necessary for cooking. The summer, so short in these polar regions, does not offer the same facilities; but young, intrepid, with a good constitution, and possessed of medical skill—a sailor by dint of experience acquired in a former voyage, and so good a sportsman that his gun might be regarded as an unfailing resource for provisioning the expedition—M. Middendorf was well formed for surmounting all the difficulties he could not fail to encounter in his journey.

The expedition left Touroukhansk on the 23rd of March, and, proceeding on the frozen surface of the Yénisséï, soon arrived at Doudina, in latitude 69°. The provisions and baggage, including nails, cordage, sails, &c., necessary for the construction of a boat, as also the instruments, were transported on eight sledges, first drawn by dogs, and subsequently by reindeer belonging to the Ostiaks and Samoyedes, who successively relieved each other along the route. A week's sojourn at Doudina sufficed for laying in a stock of biscuit; and the Dolganes and Tongouses, who were to conduct the expedition over the Toundra, or marshy plains, which extend to beyond the Piassina, having arrived, it was necessary to proceed, although two of the men who had accompanied M. Middendorf had fallen ill. In making any longer stay the expedition would have run the risk of not finding the Samoyedes, the nomadic inhabitants of the region beyond the Piassina, in their winter quarters; and although the thermometer fell on the 1st of April so low as 30° of Réaumur below the freezing point, M. Middendorf determined upon taking the two sick men along with him in a kind of box made of reindeer-hides, and placed upon a sledge; and he had reason to rejoice that he had done so, in spite of the hazards of the experiment, for by his care the sick recovered during the journey. Transported with rapidity from one Samoyede camp to another, crossing the Toundra

in a N.N.E. direction, they first ascended the Doudypta, which falls into the Piassina; they next entered the basin of the Khatanga, and, on Easter-day, arrived at the banks of the Boganida, a tributary of the Khéta, which is an affluent of the Khatanga, where they had to remain some time.

The surrounding country offered less resources than they had hoped; a Dolgane, celebrated among his countrymen for his immense wealth, consisting in herds of reindeer, and on whose assistance they had chiefly reckoned, was already gone, as is the custom in summer, to a part of the Toundra further to the north. A tribe of Samoyedes, which was still in its winter camp, could afford no assistance; and what rendered matters worse, every one belonging to the expedition, with the exception of M. Middendorf and his travelling companion M. Branth, had fallen ill, being seized with a kind of measles, which very soon disabled every one from working. So situated, M. Middendorf considered himself fortunate in finding on the borders of the Boganida, in lat. $71^{\circ} 5'$, a little settlement, known by the name of Philipoff's winter-hut, consisting of four uninhabited log-huts, which might afford shelter to the sick.

At this place M. Branth commenced his meteorological observations, which were to be regularly carried on here for some time; while M. Middendorf started in a sledge for the Khatanga, down which river he intended to proceed in the summer, according to his instructions, as far as the Frozen Ocean. Arrived at a Russian village, consisting of a few huts grouped round a church, in lat. $72^{\circ} 2'$ (one degree farther north than it is placed on the maps), he soon learnt the truth of what had been told him at Krasnojarsk and at Touroukhansk, that there was no kind of craft on the Khatanga, except a few very small boats, which could in no way serve for a voyage of any length.* The stunted trees of the forest, whose farthest extremity extended to this spot, were quite unfit for the construction of even a boat, and in other respects also the aspect of the country, particularly at this time, was equally discouraging. Two chiefs of the Yakouts and Dolganes, with whom M. Middendorf entered into communication, were so much the less able to assist him as a dreadful epidemic—the same disease, in fact, with which his own companions were seized—was extending its ravages more and more along the Khatanga. In more than one winter habitation M. Middendorf found all the inhabitants, without exception, a prey to the attacks of the malady, without possibility of relief, and without a single member of the

* A little way below this village M. Middendorf found the wreck of Laptieff's boat—its state of preservation, after having been exposed under the 73rd parallel of latitude, to all the inclemency of the weather for more than a century, afforded sufficient proof of the excellent quality of the larch timber of the banks of the Lena.

family being able to light a fire, or bring water to his friends, dying of thirst. This circumstance, in particular, seemed to render quite hopeless the idea that the voyage by the Khatanga could possibly succeed, and pointed out the necessity of seeking some other route by which to arrive at the sea coast.

On his return to the Boganida, M. Middendorf found his people so far recovered as to be able to work. They accordingly set-to, and having discovered, with considerable difficulty, some trees fit for their purpose, situated at a day's journey to the south, they began the construction of a boat of 12 feet keel. Not a single one of the Russians who accompanied M. Middendorf had the slightest idea of such an operation, so that on this occasion he was not only obliged to have recourse to his technical knowledge, but, with hatchet in hand, to take an active part in the labour.

During a sojourn of a few weeks, M. Middendorf was himself enabled to judge of the extreme poverty of these regions, and of the great scarcity of animals; while the accounts given by the Samoyedes of the plains further north, where there scarcely existed a trace of organic life, were truly appalling. It would evidently be impossible to complete the collection of the natural productions of the country during a painful and dangerous journey, when the attention of the travellers would be occupied by so many other objects, and when their utmost efforts would hardly be sufficient to enable them to overcome the obstacles which the nature of the country would oppose to their progress. M. Middendorf accordingly decided upon dividing his people into two parties, one of which was to remain, under the direction of M. Branth, on the borders of the Boganida, in order to collect objects of natural history, and to continue the meteorological observations; whilst the other, immediately under himself, would endeavour to reach the sea.

Some Samoyedes of the tribe of Assia, with whom they had entered into communication, declared that they were, together with the rich Dolgane already mentioned, the sole inhabitants of the immense territory forming the most northerly part of the country between the Piassina and the Khatanga; that in the spring they regularly went northward as far as the borders of the Taimyr, but never further, because beyond that point the sterile soil ceased to produce even that species of moss which formed the food of the reindeer, the only wealth of these nomadic people. The Dolgane, who had been sent for, having arrived, M. Middendorf resolved to accompany these people as far as the Taimyr, and then, by embarking on this river, to endeavour to reach the sea. It was agreed that they should meet the Samoyedes again on the 9th of May, on the banks of the Novaia, in the Toundra. A

student of the corps of topographical engineers joined the expedition at the moment of its departure. The skeleton of the boat being completed, it was put upon a sledge, and, accompanied by the topographer and three other strong and brave men, the traveller started on the 7th of May towards the north. With great regret he found himself obliged to take into these regions, where the means of transport are so scarce, a train of 68 reindeer, yoked to eight sledges, three of which were loaded with firewood.

Almost immediately they felt the sad effects of the fatal epidemic, which for the present rendered all their efforts to penetrate into the country doubly difficult. In order to have a sufficient number of men to attend to the reindeer, they had been obliged to collect several from the distant borders of the Khetia, and a Tongout, who was to serve them as guide, having fallen ill, could not follow the expedition.

Arrived on the 9th of May on the banks of a stream, they thought they had reached the Novaia, whilst in fact they were still distant from it a day's journey; but the Samoyede Assias, whom they expected to meet here, were not to be found, and it was not till after a search of three days that four of their tents were discovered in these deserts, covered with snow. Faithful to their promise, the tribe had dragged themselves forward to meet the travellers, although they were seized with that dreadful malady which had already destroyed a great portion of the meagre population of these countries. M. Middendorf no longer found in these tents the men whom he had known on the Boganida, who were then the chiefs of the people: they had all died, and of 35 individuals who were left, one only was well, and another could barely, upon urgent necessity, leave his bed for a few minutes—the remainder appeared doomed. Fortunately the traveller, provided with a few medicines, was enabled to apply the resources of his art, and attach these people to him by the bonds of gratitude, a circumstance which subsequently proved of great advantage. In the mean time he was himself a sufferer by the distress of the tribe: the Samoyede women, who had engaged to make fur coverings for the tents, were unable to work, and the travellers were in consequence exposed (from the 15th to the 18th of May), in a tent but half-covered, to a cold of 18 degrees below 0 of Réaumur's scale, and to a violent tempest.

On the 19th they were enabled to proceed, arrested more than once in their progress by storms, after which the sledges could only be found by digging for them in the snow, which completely buried them. It was not till the 28th of May that the party reached the Logata, an affluent of the Taimyr, where the rich Dolgane awaited to transport them to the banks of the river on which they were to embark. The thaw having commenced,

rendered this part of the journey doubly harassing. A great number of reindeer sunk under the fatigue before the end of the journey, and when the Taimyr was reached (on the 22d of June), although still at a great distance from the point where this river falls into the lake of the same name, the Dolgane thought proper to abandon them.

From a hill on the right bank of the river, M. Middendorf saw at a great distance on the other side, and extending east and west, a chain of mountains which bounded the horizon in that direction, and was therefore able to judge how very erroneous are the maps which we possess of these regions, and that they do not correspond with Laptieff's journal of his expedition. According to these maps the Lake Taimyr has only insignificant affluents, and the river of the same name is but the outlet of the lake; whilst in reality this river is imposing by the volume of its waters even far above the point where it enters the lake, which it traverses in its western part.

The first object of the travellers was to complete the construction of their boat, although they had nothing for its lining but the planks which formed the bottom of the sledges. A few excursions to points at various distances served to give them a notion of the country. Meanwhile the river rose by degrees, increased by the melting of the snows, and on the 23rd of June (O.S.) it was quite free of ice. By this time also the boat was ready; the days had been almost always rainy, and they had therefore worked principally at night, or rather during those hours which correspond to the night at this season, but during which the sun never sets in these high latitudes; and it was during a bright midnight sunshine that the boat, constructed with so much perseverance, and completed in spite of so many difficulties, was at last launched on St. John's day, under the 74th parallel of north latitude.

After having completed as far as possible in this place the collection of objects of natural history, and having returned from a little preliminary expedition, undertaken for the double purpose of exercising the crew and of approaching, by means of an affluent of the Taimyr, the mountains which had been seen in the distance, in order to examine them geognostically, the travellers embarked on the 4th of July, with the intention of descending the stream down to the sea. A single man was left at the place of departure to attend to the fishing during the season, and thus prepare fresh provisions for the expedition on its return.

Very soon, however, M. Middendorf was obliged to stop, and even to return. Two Samoyedes, who were descending the stream, having met with the expedition the second day, gave such information as deprived the travellers of all hopes of reaching the sea with a single load of provisions such as their boat could carry. It

therefore became necessary to establish somewhere on the banks of the river a depôt of provisions, buried in the earth to secure them from accident, and to have besides at least one cargo complete at the moment they should begin the passage of the lake. However unfortunate the loss of time, they were obliged to descend and re-ascend the stream several times for the transport of the fish and provisions to the spot chosen for the depôt.

On the tongue of land not far from where the river falls into the lake, and which they had descried from the summit of some neighbouring hills, they met with some people for the last time; these were Assia Samoyedes, and from them they learnt that the kind of promontory which advances into the river, that is several verstes wide, was the furthest northern point visited regularly by the tribe—none of them, nor any living being, had been beyond. All they could say of the river higher up, seemed like a vague and forgotten tradition; nevertheless, the assertion that further on, the navigation was rendered impossible by the rapids and falls that intercept the course of the river, deserved some attention.

M. Middendorf, thinking he recognised some of the localities pointed out in the journal of Laptieff, judged that he was not more than 150 verstes from the sea. A large quantity of provisions (150 salmon) were, together with the winter clothing of the people, buried at this place. The boat was loaded, as also a canoe bought of the Samoyedes, and which was taken in tow. Time passed on: but whatever may have been the impatience of the travellers, it was still impossible to start—impossible to struggle against the wind, which for many days in succession blew from the north with great violence. It was in vain that they tried to take advantage of a momentary calm on the 23rd of July, in order to advance by dint of rowing. Three days after, notwithstanding their efforts, they found themselves again cast upon that fatal tongue of land—the tempest, more violent than ever, having again raised the waves of the lake and of the stream. From the 27th of July, however, the travellers were enabled to continue their voyage towards the north, although slowly, for they were still frequently obliged to seek refuge in some inlet against the violence of the weather, and not till they had traversed the lake could they hope to be no longer impeded in their progress. Below the lake the river intersects the chain of mountains which extends, as it appears, in a line parallel with the coast. Where the river cuts the chain, it is confined between high rocky precipices, often presenting the strangest forms: in this part of its course it is more sheltered from the wind, and even when this was contrary, the boat was less affected by it, being hurried on rapidly by the velocity of the current toward their so much desired goal.

But other dangers, which would have driven back the most intrepid, now threatened the expedition. The provisions, with which the boat was laden on leaving the tongue of land where the depôt was established, were now nearly all consumed; and although they did not cease fishing during the whole time, they scarcely obtained anything. They were obliged to halt for a whole day (the 2nd of August) in what seemed a favourable spot. Whilst his companions cast their nets, M. Middendorf, his gun under his arm, climbed up the rocky banks in the hope of being able to kill some straggling reindeer; but this sacrifice of time, when every hour was precious, was wholly useless; for, after a whole day's labour, they succeeded in taking only three little fish, and some reindeer which M. Middendorf had seen, had run off before he could approach within gun-shot of them.

As they advanced, they continued to flatter themselves that they would see the sea from the summit of the rocks; but this hope was often deceived. On the 6th of August, towards the close of the day, they reached a spacious cavern, in which they passed the night. It was perhaps the same mentioned by Lapuëff in his journal, in which case they would only be fifty-two verstes from the sea. This idea inspired the crew with fresh courage, and M. Middendorf resolved on persisting in his enterprise, notwithstanding the extremity to which the expedition was reduced. On the 4th of August he had divided among his people what biscuit remained, and having no longer any bread, and being also without wood, they were compelled to eat alone and raw what little fish they succeeded in taking. Such was the situation of the travellers, when the snow, which fell on that day, and the ice, which covered all the pools during the night of the 7th, warned them that the summer, so short in these arctic regions, was already passed, and winter approaching! From this moment it continued to freeze regularly every night. The coast however was not yet reached, and what would not be the difficulties of the return, when, in order to arrive at regions, if not inhabited, at least occasionally visited by nomadic tribes, they would have to stem the current whose rapidity they so well knew? Besides the fear of perishing of hunger in these dreadful deserts, they would, by delaying their return much longer, run the risk of being hemmed in by the ice. Under these circumstances M. Middendorf gave the most admirable proof of courage and perseverance, for he continued his route, though nothing as yet indicated the proximity of the sea.

Once, and once only, since leaving the promontory they had discovered some indications of these wilds having been before visited by man—this was on the 9th of August. A mammoth's tusk, sawed into three pieces, a fragment of the handle of a hatchet, a piece of wood partly charred, and the jawbone of a horse, found

upon the bank, seemed to prove that Laptieff and his companions had halted here. The next day they perceived on the bank of the river the skeleton of a mammoth, still well preserved, and, what they considered a valuable discovery, two trunks of trees, which the waves had thrown up.

The influence of the tide was now felt, and the boat was rapidly hurried on by the combined force of the stream and the ebb, when at last, on the 12th of August, M. Middendorf perceived in the distance, by the aid of his glass, an immense block of ice. Increasing their efforts, they hailed this appearance with joy; and although they soon had to struggle against the flood-tide, they ultimately reached the sea where it forms a deep gulf, extending towards the north. What had been taken in the distance for a block of ice was a very large mass of quartz, pushed up probably by the waves * at the flooding of the river, and hitched on a rocky islet: a quantity of floating timber was strewed on the shore.

Animated by success, the intrepid traveller prepared the next day to put to sea, in order to reach a promontory which rose to the east of them; but a contrary wind and shallows forced them to return in lat. 76° ; and M. Middendorf having lost a few moments in observing some seals that were swimming in great numbers round the boat, it was not without great difficulty that they succeeded in gaining the islet where they had passed the preceding night.

It was easy to foresee that the return would be yet more harassing and dangerous than their progress to the sea. Unwholesome and insufficient food, excessive labour and difficulties almost insurmountable, had exhausted the strength of the travellers; above all, the necessity of frequently jumping into the cold water, either to disengage the boat from a shoal on which it had grounded, or in order to reach the bank which these same shoals prevented from being otherwise approached, had greatly impaired the health of the party; more particularly as for more than a month they had been obliged to forego even the shelter of a tent during the night, the size of the boat not allowing them to carry so bulky an object. In such a state of weakness none were able to handle an oar for any length of time; they could only reckon, therefore, on their sails for ascending the stream, the navigation of which had become so much the more difficult as the Taimyr had fallen 6 feet during the last few days. The weather was getting every hour more severe, the nights cold and dark; the river on both sides was fringed with ice, and the boat, covered with it, had become heavier.

Fortunately the wind, now blowing from the N.E., continued favourable, and the travellers rejoiced that a strong wind, to which

* More probably deposited by ice.—Ed.

they set every sail, enabled them to stem two of the rapids which the Samoyedes had told them of, and which otherwise it would have been impossible for them to ascend. Such is the nature of the streams in these regions, that, in descending, they had not even perceived these rapids. In this rigorous climate, where the soil remains continually frozen to a depth much greater than that of the rivers, these latter are not supplied by any springs; in the spring the beds of these torrents are filled to the brim by the melting of the snow; the stream then bears along such a large volume of water, and its surface is raised to such a height, that it is quite level, notwithstanding the irregularities of its bottom; but as soon as these floods have rolled away and the level of the water has sunk, this is no longer the case.

At the end of six days the expedition reached the cavern where they had before rested. On this occasion they halted there in order to repair the boat, which, having been cast against a rock in a squall, had lost its rudder; fortunately they had wood for the purpose, having picked up a quantity on the sea-beach.

Four days later they had reached the northern extremity of Lake Taimyr, and being close-hauled in order to double a little island, the waves broke over the boat, and compelled M. Middendorf to run her on a bank; the clothes of the travellers, steeped in water, froze upon them, and in this state they had to wait four days till the tempest had somewhat subsided. Neither fishing nor hunting could be very productive under such circumstances. The pains of hunger were severely felt; and on the 27th, M. Middendorf, having ascended a hill near the shore of the lake, distinctly perceived by his glass a white band which stretched across the water. This discovery was well calculated to excite alarm; no time was to be lost, and accordingly the next morning they again proceeded, in the hope of being able to coast along the western shore; but the boat was soon stopped by that fatal barrier of ice which M. Middendorf had seen in the distance the day preceding.

The direction was immediately changed: it was thought that, perhaps, the part of the lake through which the river runs might still be free of ice, and accordingly an endeavour was made to reach this only channel of safety. But a dead calm had succeeded the storm, and the travellers perceived, with no small surprise, that the water, through which the boat was passing, became so rapidly covered with ice that the surface froze, so to say, immediately behind the boat as it advanced. The danger of being hemmed in by the ice in the middle of the lake now became imminent; there was no time to be lost; it became urgent to reach immediately the nearest shore at all hazards. It was now remembered, that in one part the barrier of ice had been observed to have

but a trifling breadth, and that the open water, which had been seen beyond, appeared to extend to the western shore. Having therefore gained this point, a passage was effected by breaking the ice with hatchets and the oars; and the boat was only a few fathoms from the open water, when, to the inexpressible terror of the travellers, the whole mass of ice began to move, the canoe, which had been taken in tow, was crushed in an instant, the boat's rudder was carried away, and she leaked all over; they, however, succeeded in floating her into clear water, but the efforts of the crew, increased by the greatness of the danger, were hardly sufficient to keep her clear of the floating shoal, which continued to follow them, threatening destruction every moment. At the very instant of reaching the shore the boat was caught by the ice; with difficulty the cargo was saved, and when, afterwards, the boat was hauled up, it was found that her side was stove in.

Thus did the boat-wrecked party find themselves without provisions, at a great distance from those they had buried higher up, far from all succour, and in the midst of bare rocks upon a desert shore. The only hope now left was that of falling in with some Samoyedes, but this hope must have appeared almost chimerical. They did not however lose courage; the wreck of the boat served them for constructing a sledge, and they proceeded. Unfortunately the rocks, over which they had to pass, were not yet covered with snow, and the sledge, destroyed by the friction, was broken before they had hardly gone 3 verstes.

The next day, the 30th of August, M. Middendorf, worn out with anxiety and the excessive fatigue of the last few days, was taken seriously ill, and felt it to be impossible for him to follow his companions. He shared with them a small remainder of portable soup, which he had kept as a last resource, and then they were compelled, not without regret, to kill their faithful hunting dog that had been so useful during the expedition; even the blood of this animal was not disdained; his flesh was divided into five portions; and thus provided, M. Middendorf ordered his four companions to go in search of the Samoyedes in the desert, and if possible to bring him assistance.

As for himself, he remained alone, ill, without shelter at the approach of an arctic winter, under the 75th parallel of latitude, and exposed to all the inclemency of the weather. He remained thus for 18 days, a fact without a parallel in the history of travels. Fortunately he found himself in some degree sheltered by the snow which the wind had piled up; and during the last three days, whilst a violent storm lashed the plain with fury, he remained buried under the snow, and to this circumstance he no doubt owes his life. At length, no one coming to his assistance, he felt assured that his companions had perished; at times he was seized with

horror at the idea that his dreadful situation would deprive him of reason. At last a happy crisis took place, and he felt again the desire of living. With some fragments of wood that were near him he managed to light a fire, sufficient to melt a little snow; into this water he poured some spirit of wine in which an object of natural history was preserved; this reanimated him a little, and after so many sleepless nights he was able to sleep. On his awaking he was fortunate enough to take a white partridge; a small sledge was soon constructed, and, having made himself a pair of boots with a part of his pelisse, he started in the hope of being, perhaps, able to reach the spot where the provisions were deposited when they came down the river.

Forced to stop very frequently, he had not gone far when, on the slope of the mountains, he perceived three black specks which appeared to move; he went towards them; they were men, being one of his companions and two Assia-Samoyedes, his friends, who were coming with a sledge to save him. His people had succeeded in crossing over the ice of the lake instead of going round, and, thanks to this circumstance, they had met with the Samoyedes the fourth day; but since then the arctic storms, whose violence surpasses all that can be imagined, had prevented their again penetrating northward.

On the 19th of September M. Middendorf was again under the tent that had been set up on the border of the Upper Taimyr. The objects of natural history which had been collected were carefully packed up; on the 28th they quitted, at the same time with the wandering tribes, these polar regions; on the 8th of October they hailed with joy the first trees, and the next day the travellers found themselves once more in the hut of the Boganida.

M. Branth had made, during their absence, very complete collections of the products of the country; the meteorological observations had been continued during seven months. Thus the object of the expedition has been carried out more fully than was anticipated, and, as M. Von Baer says, in his memoir on this journey, "the hut on the Boganida will become an important point in researches on the distribution of organic life on the surface of the globe."

XIV.—*Details of Explorations of the Old Calabar River, in 1841 and 1842, by Captain BECROFT, of the Merchant Steamer ETHIOPE, and Mr. J. B. KING, Surgeon of that Vessel. Drawn up by Mr. KING,* and communicated by Mr. JAMIESON, of Liverpool.*

THE flood season of the Old Calabar, in 1841, was far advanced before we were enabled to commence the explorations of that river which we had received instructions from Mr. Jamieson to attempt. Owing to the occurrence of untoward circumstances in our trading occupations on the coast, and from our having subsequently been called upon to proceed up the Niger to the assistance of her Majesty's steamer *Albert* in distress there, it was so late as the 23rd of October when we arrived off Duke's Town in the prosecution of our purpose.

Deeming it necessary to acquaint the chief who resides here ("Eyamba V., King for all black man," as he styles himself) with our object in coming to the river, we immediately landed to wait upon him. Our communication did not appear at all to please him. He expressed his apprehension that our explorations of the river would lead to consequences injurious to the trade of his town; and said, "I hear your countryman done spoil West Indies. I think he want come spoil we country all same."† We assured him we only wanted to see "where all the water of the river came from."

We next waited on the chief who resides at Creek Town, in the immediate neighbourhood (King Eyeo Honesty), to acquaint him also of our purpose in coming to the river. He made no objection, but told us that the branch above Duke's Town "no go long way," and that the water of the other branch (Cross River) was already falling so fast, that if "steamer once catch ground, him stay there till river rise again next year."

Oct. 25th.—All needful preparations being made, we weighed anchor to proceed up the branch above Duke's Town. Very shortly afterwards we passed Willie Tom's, or Old Town, prettily situated on an elevated sandhill on our right. Here the stream makes a sudden and rather angular turn from N. E. by E., coming up to W. N. W. $\frac{1}{2}$ W. greatly contracted, and forming, on its opposite side from Old Town, an alluvial elbow. Above, it widens again into an expansive reach, rounding at its upper end

* The chart of the river, which accompanies this paper, was also prepared by Mr. King, and obligingly communicated by Mr. Jamieson.—Ed.

† It may be necessary to explain, that on the west coast of Africa the English language is spoken by the natives in this imperfect manner, and that, when interpreters are carried into the interior, they must be spoken to in a similar style, in order to convey your meaning in the way they are most likely to comprehend it.

to the eastward, and having throughout a depth of 6 and 7 fathoms at low water. In this round we passed on our left the entrance of the creek leading to Creek Town; and immediately after, that of another, leading, as our pilots informed us, to a small town named Ebundâ, a short distance in the bush. Proceeding onwards in from 9 to 10 fathoms, we next turned into a beautiful reach running in a N. $\frac{1}{2}$ E. direction, 200 to 250 yards wide, but having somewhat varying and irregular soundings. The bank here on our right was firm, and elevated into a sandy hill, which was picturesquely portioned out into native plantations. A few of the slopes were covered with wine palms, from many of which, we observed calabashes suspended near to their summits, to receive the minniefôt they give when tapped.* At 10 o'clock we were abreast of a town situated on our right, in the upper end of this reach, named by the people of Old Calabar "Little Guinea Company," and being anxious to see what a town with so imposing a name was like, we anchored, and proceeded on shore. We landed, under the shadowing branches of a large bombax, amongst a crowd of people, who stared at us in silent astonishment; and, walking to the house of the chief or head-man, named "Otoo," we were introduced to him by our interpreter as Makarra (white man) come to see him. His countenance expressed anything but satisfaction at our visit; nevertheless, a piece of cotton cloth having been spread upon a small ebony table, and minniefôt and hollands placed upon it, we were asked to drink; Otoo having first partaken of both himself, by way, as is the custom in these parts, of taking what is called "doctor off it." Having drank, we asked him to accept of a small present we had brought for him, which he did, and "dashed" us, in return, a goat, a hundred yams, and a calabash of minniefôt. After some conversation on the nature and extent of trade done by his people with the neighbouring towns and villages, and an intimation that we should be happy to see him on board, if he pleased, on our return down the river, we took our leave, and retraced our steps to the boat at the landing.

This town may consist of 80 to 100 houses, with a population of perhaps 1000 inhabitants. The houses are greatly inferior to those at Duke's Town, and, excepting Otoo's, but very scantily and miserably furnished.

We weighed with the young flood, which here overtook us, and in half an hour we were abreast of Big Guinea Company, or "Guinea Company" proper. The distance between the two

* Palm wine, called by the old Calabar people "minniefôt," obtained by tapping the *wine palm* (a species of the *areca*) near to its summit, and attaching a calabash to collect the liquor as it exudes from the incision. A similar liquor is also obtained from the *bamboo*.

places may be about 3 miles, the river winding in a N.W. direction. The banks are low alluvium, densely covered with palms and other trees, and skirted with patches of young mangrove. Our depth of water was 5, 6, and 7 fathoms. As we passed, the natives crowded in hundreds to look at us, a few of the men coming armed with muskets and other weapons. Being anxious to get forward as fast as possible, we did not stop, but signified to them, through our interpreter, that we were friendly, and would visit them on our return down the river.

Continuing our course, therefore, we turned suddenly round at the uppermost of the towns just mentioned, into a fine reach running about 2 miles in an E.S.E. direction, with soundings close along its southern side of from 4 to 7 fathoms; we then rounded again to the north, passing, on our right, a mean-looking village named Imbarra; and shortly after, on our right also, the entrance of a creek leading to what is called the Little Hooieong Country. The river now begins to narrow, and to shoal to less than 2 fathoms. We here observed the last patch of mangrove, skirting the bank for about 20 yards on our left, and marking perhaps the tide's limits. The water was almost still,—just perceptibly running down in the centre of the channel. Passing a small island on our left, we had only 7 feet water, and immediately after we grounded. By lightening the vessel a little forward and reversing the engine, we got off again, and proceeded slowly, the stream narrowing to about 35 yards and winding. At 5h. 30m. we arrived off Cooieong, a small town, concealed amongst trees, on the W. bank, and deemed it prudent, from the greatly reduced depth of water, to come to an anchor for the night, purposing to examine the channel the next morning in our gig.

26th.—Having landed for a few minutes to see Cooieong, which we found in ruins and deserted, we returned to our gig to examine the channel. As we ascended, the stream narrowed, dwindling in fact into a mere creek, having only 6 feet water, with the trees on the opposite banks in many places freely interweaving their branches over us. To attempt further progress in the steamer, therefore, was altogether out of the question, and we returned on board to retrace our course to Duke's Town. Having got steam up, we weighed, and, by means of a warp astern made fast to a tree on shore, swung the vessel round and proceeded, but had not gone far when we grounded, and it was not till after several hours' exertion that we succeeded in getting afloat again. This accomplished, we proceeded slowly, and came to an anchor off "Big Guinea Company," where, according to promise, we landed. This place (called Guinea Company by the early English slavers) consists of half a dozen miserable-looking towns or villages, with a population amongst them of perhaps 3000 in-

habitants, each town or village having its respective chief or headman. Of these chiefs we visited three, who, though greatly surprised at our appearance, received us in a kindly manner, and dashed us goats and fowls, for which we made them presents in return. The people pressed around us as we passed along, and, following in a crowd on our return to the landing-place, cheered us as we pulled off to the steamer.

27th.—Weighed and proceeded at 9h. 30m.; on arriving off "Little Guinea Company" we stopped for a time to pay our respects to Oloo, and at 11h. 30m. reached Duke's Town and anchored.

The following meteorological Memoranda may be interesting. The temperature, it may be observed, is in the shade, noted from a Fahrenheit's thermometer kept upon deck for that purpose:—

Date.	Temp. Air.				Temp. of Water at Noon.	Barometer.	REMARKS.
	6 A.M.	Noon.	3 P.M.	6 P.M.			
Oct. 23	—	90	92	85	89	29.95	A.M., fine—6 P.M., rain, with thunder and lightning.
24	79	84	87	82	82		Clear and fine, with light SW. breeze.
25	79	90	92	80	89		Fine—3 P.M., rain with thunder and lightning.
26	82	89	82	80	86		A.M., showery—P.M., ditto, with light breeze.
27	79	83	85	82	80		Fine—P.M., cloudy.
28	79	83	87	84	81		Clear and fine—calm.
29	78	85	86	82	82		Ditto—9 P.M., thunder and lightning—calm.
30	79	87	89	85	84		Fine—P.M., rain—thunder and lightning.
31	76	84	87	82	82		Fine—P.M., cloudy.

Having thus ascertained the unimportant character of this branch of the river, we felt anxious to know something of the nature and extent of the other branch called Cross River; but to attempt its navigation with the steamer when its waters were receding and already much fallen, was impracticable. We therefore looked about for a substitute of a less draught of water, by which to accomplish our purpose, and nothing appeared more suitable than the state-canoe of King Eyamba with its crew of pull-away-boys.* With a view, if possible, of arranging for the loan of this canoe, we waited on Eyamba, who on hearing our request looked quite astonished, and enquired if we were serious; on assuring him that we were, and stating to him our plan of proceeding, he endeavoured to dissuade us from it by telling us that the "Bosun people"† would kill us and make slaves of the kroomen. Mr. Becroft however pressed his request, and concluded by saying, that if it was not granted he would go next year in the steamer. On hearing this Eyamba said, that he

* Pull-away-boys, the name given to natives who are usually engaged by the shipping in the river to paddle or row boats, and otherwise work for the vessels.

† Name given at Old Calabar to a people up Cross River.

would "look for head, and call man to speak about it." Accordingly, a day or two after, he called a council of his principal men, together with King Eyeo of Creek Town, when the resolution was come to amongst them, that the canoe should be given. Mr. Becroft was summoned before them, a messenger having been sent with Eyamba's staff for that purpose; and on his making a formal request for the use of the canoe and its pull-away-boys, he was told they were at his service.

Having made the canoe as comfortable as the nature of things and materials would admit, besides arming her as far as seemed needful, and taking on board some of our own kroomen, our own interpreter, and a leadsmen from the steamer, we left that vessel to lay off Duke's Town till our return.

Nov. 4th.—Proceeding down the stream for a distance of about 5 miles from Duke's Town, Eyamba himself accompanying us in a boat about half the way, we came to the point where this branch and that of Cross River form a confluence, the entrance to the latter being much obstructed by large mangrove islands. Turning into a large creek-like opening on our right, formed by the main land on one side, and by a large island of mangrove on the other, and proceeding about a mile in a N.N.W. direction, with 4 and 5 fathoms water, we shortly after entered the first, or sea reach of this (the Cross River) branch of the Old Calabar. This runs in a N.W. direction, a broad and expansive sheet of water, varying in width from 1 to $1\frac{1}{2}$ miles, but having miserable soundings. These we found 1, $1\frac{1}{2}$, and 2 fathoms, but the state of the tide was nearly that of low water, and the rise, as indicated by the roots of the mangroves, was apparently from 7 to 8 feet. The stream, as we advanced, became broken into numerous channels by mangrove islands, which beautifully diversified its aspect, and gave to the whole an exceedingly picturesque appearance. As we ascended farther, though still exhibiting an extensive surface, it narrowed a little, which had the good effect of deepening the water. Our pilot now kept the canoe as close as possible to the bush, out of the strength of the current, and to take advantage of every little assisting eddy. Passing a tolerably-sized divergent on our left, running off, as the pilot informed us, to Eggbo Sairra, we came to anchor for the night.

5th.—At daylight we weighed again and proceeded. The reach we were in extended N. by E. about 2 miles, and was bounded on both sides by an impervious mass of the most luxuriant vegetation, with here and there only a small patch of mangrove. Proceeding onwards at a slow rate, we next entered a N. by W. reach, 250 to 300 yards wide; about the middle of which, on the south end of a small island, we observed the last mangrove bushes. Further on a little, the river trends to the N.W.; its banks, com-

posed of a blackish loam, appearing now a few feet above water. At 8 h. 30 m. we passed another considerable divergent running off on our left also towards Egbo Sairra, and entered at the same time the most beautiful reach we had yet seen. In this reach, extending N.N.E. for nearly 3 miles, with a width varying from 450 to 900 yards, we observed several hippopotami, animals we had not seen since leaving the Niger. The aspect of the country now changes, cultivated patches, principally of cocos and yams, extending along on our right, while the W. bank forms a woodland of beautiful appearance. Passing a long woody island, extending nearly throughout this long reach, we arrived at what may be termed the commencement of the delta of this river. The main body, here 1000 to 1500 yards wide, divides into three separate streams, the centre one (by which we had ascended) forming by much the widest outlet for its waters. Of the other two, one flows to the S.W., towards Egbo Sairra, being the next widest stream, while the third pursues a peaceful course to the E. and S.

Being now in the main trunk of the river, and continuing our course up another extensive reach in a N.N.W. direction, with plantations and scattered bombax on each side of us, we arrived at Iericock landing, upon the W. bank of the river. Here it was determined to remain for the night, our men being a good deal fatigued with their day's exertions.

Thus far the banks of the river are low and even, composed entirely of a rich alluvium, resting, since we entered the main body of the river, upon a substratum of a ferruginous clay. At Iericock the aspect changes, the W. bank rising into a hill of about 120 feet, covered with trees and plants of various descriptions; the hill is composed of sand and clay, with numerous quartz-pebbles of a roseate appearance, and rounded by attrition. In two places near to where we landed, these materials were found, upon examination, cemented by the red oxide of iron into a conglomerate. A sandy beach extending about 40 yards here margins the river, which at this point has a width of about 1200 yards, divided by two finely wooded islands into separate channels. On ascending the hill we came to the town of Iericock, the inhabitants of which we found were absent in their plantations. It consists of not more than 100 houses, which are much scattered, with the ground cleared to some distance around.

6th.—We started early, after a night of much annoyance from mosquitos and sand-flies; the morning was dull and misty, which prevented our seeing to any distance, and gave to every thing within view a distorted appearance. Keeping along the W. bank in a N.N.E. direction, we reached at 8½ hours, a village belonging to Eyamba of Old Calabar, and named Biabboo. It was a

wretched-looking place, situated on the E. side of the river, containing a few miserable-looking inhabitants, chiefly women, most of whom, our pilot informed us, had been sent from Old Calabar for the *crime* of having "two piccaninnie one time" (twins).

The river now opened into a wide expanse of a semilunar form, rounding to the westward, and containing two beautifully wooded crescent-like islands. We passed up the westernmost channel, keeping as close as possible to the mainland bank, out of the strength of the current. The scenery was very beautiful, many gay flowers adorning the banks. At 4 h. 30 m. we emerged from this channel into a fine reach extending W.S.W. about 2 miles, and gradually narrowing as we ascended; the banks were partially cultivated, the other parts being overrun with a coarse grass, and studded here and there with large bombax. Pursuing our way up this reach against a current of 3 miles an hour, we arrived soon after dark at Etoo, upon the W. bank, but learning that the inhabitants were opposed to our landing from an idea that we had "doctor for small-pox,"* we crossed to the opposite side and anchored. It was necessary to be on our guard at this place, as the Etoos are known to be treacherous and cunning, and have frequently plundered Calabar canoes on their way to market. We therefore kept a good look-out, having fire-arms loaded and ready in case they might be needed.

7th.—We weighed at daylight and proceeded, the river trending N.W. and rounding to the northward, with an average width of about 300 yards. We passed on our left a small creek, leading, as our pilot informed us, to the Innieong country. At 10 h. 40 m., while we were at anchor and at breakfast, we were surprised at seeing a large canoe coming up the river with native flags and music, and having two men at the bow keeping up as constant a fire from muskets as they were able. On nearing us they ceased firing, when we desired the interpreter to hail and demand what was wanted; on doing so, he was answered that it was the "King of Innieong come to see white man," whom he heard "lived for water." The old gentleman, whose name was Eggbo Anna, on coming alongside, presented us with a goat, and when we shook him by the hand and thanked him for it, felt quite pleased and happy, signifying through the interpreter, that he had "never seen white man before;" and that his "heart was glad, now he look him." Continuing our course, the river next opened into a reach running N.E. by N. for some miles, 500 to 600 yards wide at first, then narrowing and confined within perpendicular banks of an ochreous nature.

* A supposed preparation or medicine, in the form of a powder, believed, according to our interpreter's representation, to be diffusible through the atmosphere so as to cause the disease mentioned.

Patches of yams, cocos, and maize, skirted the banks at intervals, while the country behind was plentifully and beautifully wooded. We passed several canoes engaged in fishing, an occupation which the natives here follow by means of ingeniously contrived baskets, fixed by stakes in the shallower parts of the river, into which the fish enter as they ascend against the stream. At 3 P.M. we arrived at a small town on the W. bank, and came to for a time to give our men a little rest. Leaving this town and again continuing our course in a N.E. by E. direction, we passed shortly after, on our left, a mural precipice of about 100 feet, apparently of a sandstone formation, being the commencement of a low hill extending to the eastward and northward. Our pilot informed us that the Innieong people, as well as those of Old Calabar, look upon this cliff as sacred. The river, as we now advanced, varied in width from 150 to 200 yards, with so strong a current that our progress against it became exceedingly slow. At 7 P.M. we arrived at a small village which our pilot informed us was close upon "*Bosun*," and having made fast for the night, dispatched a messenger to apprise the chief of that town that we would be with him in the morning.

8th.—Started early, the messenger having returned to tell us that "*Bosun* man" would be glad to see us. Continuing our course for a short distance to the eastward up a narrow reach, having 7 to 10 fathoms, we came to a large island, and taking the northernmost of the two channels formed by it, proceeded onwards against a powerful current, and at 8 h. 40 m. arrived at *Bosun*. We were surprised to find this town situated upon the upper end of the island, and not upon the mainland bank of the river, as we had been led to understand, and that its name is in reality *Omùn*, and not *Bosun* as the Old Calabar people call it. On landing, which we did amidst a large assemblage of people collected to see us, we despatched our interpreter to acquaint the chief of our arrival. His reply was, that he would send a person to conduct us to him; and following this guide, who shortly afterwards made his appearance, we passed along a few narrow windings to his house. It was a wretched-looking place, partly in ruins, with a collection of human skulls piled up at the entrance. These presented a revolting appearance, being coloured with red and yellow ochres, and having eyes of clay in the sockets. We passed through a small court crowded with women, and stooping under a low doorway, the only inlet, into a dark and narrow apartment of a semicircular form, were presented to *Dee-un*, the chief. He was a stout elderly man of heavy appearance, and without any thing at all remarkable about him. Beyond a mere expression of satisfaction at seeing us, he gave no indication that he cared about our visit, his principal men or "*gentlemen*" around being

the only speakers. These appeared to be much gratified with our arrival, and signified their hope that now that white men had found their way to Omùn they would return to trade with them. Dee-un dashed us a hundred yams, and would have added a bullock, which we however declined from the lack of accommodation in the canoe. On hearing this he inquired if there was anything else he could present to us, and without waiting for a reply, ordered a *slave* to be brought in for that purpose—the poor fellow, trembling with fear, was placed before us, and no doubt felt very grateful for our declining to receive him. Dee-un, however, and the “gentlemen” around him, were offended at our refusal, and entered into a noisy *palaver* amongst themselves on the subject—which having at length ceased, our interpreter explained the matter to them, and we departed.

We visited in turn the principal “gentlemen” of the town, who literally overwhelmed us with their kindness. In the evening we were entertained with music (such as it was) and dancing; and when we took our leave, to return for the night on board of our canoe, we were lighted to the beach with torches, preceded by singing-men, sounding the white men’s praises. These men continued their singing until a late hour, nor would they have retired, perhaps, until morning, had we not requested them to do so, and leave us to enjoy the repose we needed.

The town of Omùn, as mentioned before, is situated on the upper end of a large island, and contains, so far as we are able to judge, a population of perhaps 5000 inhabitants. The people in their general appearance resemble those of the towns of Old Calabar, and are marked with three horizontal incisions upon each temple, in a similar manner. They dress also as the latter do, but in an inferior style, as silks and the finer qualities of cotton cloths are excluded by the traders of Old Calabar from this market. The children and youth of both sexes go naked, a practice in general continued until marriage, which usually takes place early in life. Having but few wants, and those easily satisfied, these simple people may be said to be happy. We find them exceedingly hospitable, and anxious that we should remain a few days and visit their plantations.

The language here differs from that of Old Calabar, in illustration of which their respective numerals are subjoined.*

A market is held in a central part of the town, presenting

* English.	Omùn.	Old Calabar.	English.	Omùn.	Old Calabar.
One	Woo-nee	Kèt.	Seven	Obor-offy	E-teábbá
Two	Of-fy	E-bá	Eight	Obor-ottút	E-te-eitá
Three	Ot-tút	E-á	Nine	Obor-onny	O-so-kèt
Four	On-ny	E-náng	Ten	Dee-up	Boo-up
Five	Koo-bòh	E-tún	Twenty	Nay-nup	Á-e-dap
Six	Obor-oonce	E-tukèt			

the usual miscellany of African productions, with the same noisy and eager system of barter which we have observed wherever we have been in Africa.

9th.—We found the water of the river rapidly falling, there being a difference this morning of 8 inches since 6 o'clock last evening. Altogether, as indicated by the bank, the water had fallen 2 fathoms. On this account, as well as from the uncomfortable accommodation on board the canoe, we determined to ascend no further. Landing, therefore, and taking leave of Dee-un and our several friends, we returned on board, and started at 1 h. 30 m. P.M., to retrace our course back to the steamer. We were accompanied for a short distance down the river by a few of the "gentlemen," who, on leaving us in their canoes, expressed individually a wish for our safety, requesting us at the same time not to be too long in returning to see them. We stopped for the night off the town of Biabboo, distant from Omùn about 16 miles, and proceeding again at daylight next morning (November 10), arrived alongside of the steamer off Duke's Town at 1 P.M., having been absent 6 days on our expedition.

METEOROLOGICAL MEMORANDA from Nov. 4 to 10, inclusive.

Date.	Fahr. Therm. in Shade.				Temp. of Water at Noon.	REMARKS.
	6 A.M.	Noon.	3 P.M.	6 P.M.		
Thursday .. 4	78	87	84	79	80	A.M., fine—P.M., cloudy.
Friday..... 5	75	84	87	82	79	Remarkably fine.
Saturday... 6	78	82	82	78	79	A.M., misty—P.M., cloudy and fine.
Sunday 7	76	81	82	80	79	A.M., rain with thunder—P.M., fine.
Monday ... 8	78	84	88	80	—	A.M., fine—6 P.M., rain with thunder.
Tuesday ... 9	78	82	83	80	78	6 A.M., rain with thunder—noon, cloudy—P.M., fine.
Wednesday 10	75	87	84	80	80	Remarkably fine.

Having satisfied ourselves by the above partial exploration, that Cross River, instead of being a branch, is, in reality, the Old Calabar River itself; and believing that a communication, in all probability, would be found by it far into the interior, it was with no small satisfaction that we received instructions from Mr. Jamieson the following year, to ascend it at its season of flood in the steamer. Accordingly, on the 7th September, 1842, we commenced its ascent in that vessel. Instead of following the course we did in our canoe expedition, up the broad and central stream which flows from the main body of the river near to Icricock, we entered (at 7 A.M.) the narrower one to the eastward, which our pilot said "went long way for big water." We found it to wind to the N.W. in a serpentine manner, with an average width of 100 yards, and having throughout a depth of water from 4 to 6 fathoms. Its banks are alluvial, covered with palms and other trees, and

margined at intervals with patches of mangrove. Passing a town situated on a sandy hill which extends for a few miles on the N.E. side of the stream, and emerging at 2 P.M. into the main body of the river, we came to an anchor about an hour after, off Icricock. Here we remained for the night on account of the weather; it rained in such torrents that we were unable to see half-way across the river.

10th.—At 7 A.M. we weighed and proceeded, running along the western bank in 4, 5, and 6 fathoms. At 8 hours we crossed over to the eastern bank, passing Biabboo, with the view of proceeding up the eastern channel formed by the islands immediately above this village, having in our canoe-expedition of last year taken the other. We found this channel throughout to have a depth of 5 fathoms, with an average width of 120 yards. Pursuing our course we passed Etoo, and arrived at 1 P.M. at Omùn, and anchored. Our friends here were greatly pleased to see us once more, but showed themselves very doubtful as to the character of the conveyance by which we had this time come, making no secret of their suspicions that the propelling power of the steamer was an evil spirit, or, as our pilot interpreted it, the "debil." We invited some of the principal men, or "gentlemen," to go on board, but to this they would by no means consent; until having seen some Old Calabar native traders (who were here for the purchase of oil) going off to the steamer and returning in safety, they at last ventured to go on board; when, so soon as their first feelings of alarm had subsided, they viewed every thing with the utmost degree of wonder and admiration. In the evening it rained in torrents, accompanied with much thunder and lightning, which so suddenly lowered the temperature (from 87° to 74°) as to cause discomfort to all on board.

11th.—At anchor all day, procuring fire-wood and other necessities.

At 8 P.M., intending to give a treat to the people on shore, we commenced the discharge of a few rockets, but learning that it alarmed instead of pleasing them, we discontinued the display.

12th.—This morning we were informed that many of the inhabitants had gone into the bush from the apprehension caused by our rocket exhibition of last night.

Remained at anchor all day, still wooding.

13th.—We weighed at an early hour and proceeded, taking with us as passenger one of the Omùn "gentlemen," named Anna, who requested to be permitted to accompany us as far as his plantation, some distance up the river. Our course for above a mile was to the N.E.; the river then rounding to the north and west, and extending in a fine reach varying in width from 360 to 180 yards,


with soundings throughout of from 4 to 7 fathoms. The bank on our right rises into a sandy hill of about 400 feet, and follows in an undulating line the course of the river. We passed Birrie-quèh, an Omùn town, situated upon the hill, and containing, perhaps, a population of 600 inhabitants. Further on, the river trends a little more to the west, opening up gradually to about 400 yards. It then stretches N.W. by N., with an average width of 300 yards, as far almost as the eye can see. The soundings thus far are from 4 to 7 fathoms. At 11 hours we opened another reach extending N.E. by N., and passing a small woody island, came to our Omùn friend's plantation shortly above it, and anchored. There is here a small town named Innoo-cobòh, belonging to Anna, the inhabitants of which, numbering about 300, are chiefly the slaves who work upon his plantation. We met here several Eboes, who were come to visit Anna, one of whose wives residing here, a remarkably fine-looking woman, is of their country, which extends along the opposite or west side of the river. These people differ greatly from the Eboes on the Niger, and did not understand one word of what was spoken to them by a Niger Eboe, whom we had on board as one of our firemen.

14th.—At daylight we were again under weigh, running along the eastern bank in 5, 6, and 7 fathoms. Our Omùn friend, Anna, is still with us, being deputed, it appears, by the chief of that town, to accompany us as far as Acoono-Coono (the next large town we come to), and to endeavour, with our assistance, to bring about the settlement of a quarrel of long standing, about a disputed piece of ground, forming a territorial boundary. This he communicated only last evening to Mr. Becroft, who has promised to do what he can to arrange the matter amicably, not on our ascent, however, but on our return down the river. The morning was beautifully fine and pleasant, the breeze from the hill bringing with it a most delightful and refreshing fragrance. Continuing our course up the reach mentioned yesterday (N.E. by N.), the next we opened was to the north and west, 300 to 350 yards wide, and having its banks thickly wooded. Our next lay N.E. by E. $\frac{1}{2}$ E., 3 to 3 $\frac{1}{2}$ miles long, having an average width of 250 yards, with water throughout from 3 to 5 fathoms. Continuing our course about the same distance up another, in a N. by W. direction, narrowing to about 180 yards at its upper end, and turning at a somewhat acute angle to the north and east a little, we arrived, soon after 10 o'clock, off Acoono-Coono, and came to an anchor. Here the river expanded into a lake-like appearance, having the large town of Acoono-Coono upon its east bank in the form of a crescent—the inhabitants, generally armed, crowded on the bank, greatly alarmed at our appearance, and seemingly determined to defend the town should it be necessary. Having dispatched the interpreter to acquaint them

that we were friendly. Mr. Becroft and myself shortly after followed, taking with us a few presents as tokens of a peaceful mission. We landed amidst an immense assemblage of people, who pressed so very closely around, in order to see us, that our situation was any thing but agreeable. By means of our interpreter, however, we managed to make it be heard amidst the general clamour, that we desired to be conducted to the chief. A man seemingly of authority then pressed forward, and opening a passage through the crowd, requested us to follow. We did so, and were conducted through a doorway up a narrow street into the palaver house, where presently a little decrepit old man made his appearance, whom the interpreter was desired to inform us was the person we wished to see. The house being crowded almost to suffocation, and dark from the low doorways being completely obstructed by eager spectators, we requested that a little more room might be made, and the doorways kept open for light and comfort; this done, Mr. Becroft remarked, that as we had come to see them without gun or cutlass, he expected that those around us with weapons should lay them aside, and manifest the same friendly confidence. The hint was acted upon, and guns and cutlasses immediately disappeared. We then informed the chief (by our interpreter), that "we had come from far-away country to know what things he had proper for trade in his country." He answered, "fowl, goat, yam, bullock, slave, and everything." On more particular inquiry we learned that palm-oil was made, but not extensively, and that it was disposed of to the Eboes on the opposite side of the river, who at present dispose of it to the native traders from New Calabar and Bonny. Previous to the quarrel with Omùn, before spoken of, this oil took its more natural course by the river to that town, and thence to the European shipping at Old Calabar.

In form, the town of Acoono-Coono, as mentioned above, is that of a crescent, extending in a narrow stripe for about three-quarters of a mile along the eastern bank of the river: the houses composing it are mean and wretched-looking, those even of the chief not excepted. The whole number of inhabitants may probably amount to four thousand; they are a finer-looking people in general than those of Omùn, having less of the negro grossness of feature, and are altogether a handsomer and far more intelligent-looking race, resembling those of Iddah, and others above that town upon the Niger. Both sexes wear around the middle the usual cloth of European or native manufacture, with strings of beads round the neck, wrists, and ankles. None but children are seen to go naked. Many of the females wear bracelets and leglets made of cowries, which they procure, we were informed, higher up the river; they dress their hair in a most remarkable

manner, collecting it into knots, generally one before, one behind, and one upon each parietal bone, with a thread of hair extending

between them. The national marks are  nine horizontal in-

cisions upon each temple, placed in three squares. The principal men permit their finger nails to grow without paring, which is here, as at Iddah and other places above that town on the Niger, considered to be a mark of gentility. Their manners too, resemble those of the same people, partaking of the Mohammedan form when meeting each other, or when a menial approaches his superior to address him. In the latter case he generally drops upon one knee, and leaning forward until his head comes into contact with the earth, heaps dust upon it as a token of respect and submission. We here observed native tobacco (which they say they obtain from a people to the westward), prepared exactly in the same manner as that which we observed in 1840 at Iddah, and which they smoke in long native pipes of a similar description to those used at that town. This, taken in conjunction with the fact that Acoono-Coono is little more than a degree to the eastward of Iddah, as laid down on Capt. Allen's Chart of the Niger, goes to establish that there is an intercourse between these places, though in all probability of a limited nature.

15th.—We weighed at 5h. 40m. A.M. and proceeded. The morning was dull and chilly, the thermometer at the time being so low as 72°—a degree of cold which compels us to take to warmer clothing.

The river immediately above Acoono-Coono extends N. by E. in a beautiful reach—2 to 2½ miles in length—having a continuous width of about 900 yards, with soundings along its western bank of 4 fathoms. It then trends N. by W. about 3 miles farther, narrowing to about 600 yards, and increasing in depth to 5 and 6 fathoms. Its banks, thus far, are of an ochreous clay of a plastic nature, with a top-soil of a rich alluvium, the accumulated deposits of its annual inundations; and are here varied in their aspect by scattered bombax and clusters of fan-palms—the latter likewise crown the hills on the east bank, which still run in an undulating line to the north, covered besides with a long coarse grass and patches of thick brushwood. Proceeding onwards, the river again opens N. by E. in a narrow reach of about 3 miles, at the commencement of which, on the west side, a range of hills about 250 feet high, coming from the westward, follows the line of the river, frequently presenting to it mural facings, apparently of sienite, which, in numerous places, were separated into immense masses by perpendicular fissures. The reaches now for about 7 miles run as follow:—N.E. half E. 1¼ to 1½ miles,

with an average width of 360 yards, and soundings from 5 to 6 fathoms; E. half N. 1 mile, 200 to 250 yards wide, and 6 fathoms; N.E. by N. $1\frac{1}{2}$ mile, 450 yards wide, narrowing at its upper end to 220, with 5 and $5\frac{1}{2}$ fathoms; E.N.E. $1\frac{1}{2}$ mile, 150 yards, and 8 to 10 fathoms; N.N.E. three-quarters of a mile, 200 yards, and 10 fathoms with rocky bottom; N. 1 mile, 100 yards, and 10 fathoms with rocky bottom. We passed two towns situated upon the south-east bank of the river, and distant from each other about $2\frac{1}{2}$ miles, the lowermost and largest being named Aco-Coomo. The inhabitants of both seemed at first greatly alarmed at our appearance, running and providing themselves with arms as fast as possible; but on the interpreter calling out to them that we were friendly, and not come to make war, they almost immediately quieted, and at Aco-Coomo even beckoned us to stop. We passed on, however, and continued our way against a powerful and increasing current, amid scenery of a very lovely, and, on our left, of a continuously rocky and romantic kind. On nearing the upper end of the reach, running N. about 1 mile, and having 10 fathoms, with rocky bottom throughout, the current increased to such a degree that the steamer for nearly a whole hour, perceptibly only, moved a-head. Advancing a little further we perceived that we were in a rapid, caused by the stream here coming from the E., being deflected at a right angle from a rocky wall of about 40 feet in height, forming the western bank of the river. Having passed it, we had 5 fathoms again, the river widening at the same time to about 250 and 300 yards, and rounding to the southward. We now opened a reach running S. by E. $1\frac{1}{2}$ to 2 miles, having a continuous width of about 300 yards, with soundings along its eastern side of 5 and $5\frac{1}{2}$ fathoms. On reaching its southern extremity we rounded again to the eastward, passing on our right a considerable town, hid almost from view by cocoa and other trees, the inhabitants of which, however, crowded down to the bank to see us. It was surprising to notice the absence of apprehension in these people (when contrasted with that shown by the people of the towns below), scarcely one of them evincing any symptom of alarm. Several of the women we observed, as at Aco-Coomo, were employed in boiling palm-oil in the open air, which they did, as at that place, in native earthen pots. The breadth of the river here is about 250 yards, narrowing a little further on to about 180, when it expands again into a fine open reach, N.E. by E. 2 to $2\frac{1}{2}$ miles, with nearly a continuous width of 300 yards, and soundings of $5\frac{1}{2}$ fathoms; the trendings then for about 7 miles are as follow:—E.S.E. 1 mile, 250 to 300 yards wide, narrowing at its upper end to about 200, with $4\frac{1}{2}$ and 5 fathoms; E. $1\frac{1}{2}$ mile, 250 yards wide, and 5 fathoms; E.N.E. three-quarters of a mile,

200 yards, and 5 fathoms; N.N.E. three-quarters of a mile, 180 yards, with 5 and $5\frac{1}{2}$ fathoms; E.N.E. $3\frac{1}{4}$ miles, 150 yards, with soundings along its south-eastern side from 4 to 10 fathoms. The banks are highly picturesque, covered with trees and palms of various descriptions; hilly on both sides, but very unlike in aspect and structure. The northern bank consists of tabulated rocky hills, apparently of sienite, rising from 300 to 400 feet above the level of the river, and presenting numerous precipitous cliffs and mural facings. The southern bank is diluvial, not exceeding anywhere 200 feet in height, and of a somewhat uniform and undulating appearance. Several villages are scattered over the former, but, excepting one (the houses of which we were surprised to see were of a conical form), almost hid from view by plantain and cocoa trees, and a thick mass of surrounding brushwood. As we passed, the inhabitants ran to the heights to see us, few that we could perceive appearing to be at all alarmed, or carrying with them defensive weapons. But few of them, we also observed, wore clothes of European or cotton manufacture, their covering being of their own grass-cloths. Proceeding onwards, the next reach we opened was E. by N., $1\frac{1}{2}$ to $1\frac{3}{4}$ mile in length, and 350 to 400 yards wide, with soundings along its S. side of 5 and $5\frac{1}{2}$ fathoms. Here again the aspect changes, the rocky hills running off at an obtuse angle to the N., and being succeeded by a comparatively level, open, and thickly wooded country. A grassy flat, extending back about half a mile, margins the northern bank of the river, with here and there a gigantic bombax throwing a shadow across its surface. Pursuing our course E.N.E. 2 to $2\frac{1}{4}$ miles; E. half a mile further; E.S.E. three-quarters; and E. again $1\frac{1}{4}$ mile, with an average width of 300 yards, our progress was unexpectedly interrupted by a powerful current, so strong, indeed, that the steamer for some minutes was unable to stem it. On crossing to the opposite bank, and advancing a little further by keeping as close as we possibly could along it, we perceived that the river at this point formed a right angle, the next reach opening about $1\frac{1}{2}$ mile directly to the southward. The banks thus far are densely wooded, none of the trees however being of a very large or magnificent description. Passing a small town on our right, situated on a grassy bank close by the water, we continued our course along the western side of this reach in 5 and $5\frac{1}{2}$ fathoms; its width we estimated from 400 to 450 yards and upwards. At 5h. 30m. we passed another and a larger town, situated upon the same side of the river, which here has a width of 300 yards, with a depth of somewhat more than 5 fathoms; the trending here is S.E., rounding to the eastward; the banks, consisting of a pink-coloured and seemingly a very plastic sort of clay, are flat

and grassy, with a wall-like appearance towards the water. Proceeding onwards we shortly after came to another and still larger town, likewise situated upon our right, and containing a population of perhaps 200 inhabitants. Leaving this, the river opened almost immediately into a fine reach N.E. by E. 1 mile, having a width of 600 yards, with an average depth of 5 fathoms. We passed two other small towns, situated, like the others, upon the left bank amid cocoas; and coming shortly after to a small woody island, which served to break considerably the force of the current, we stopped and anchored. Here we spent but a very indifferent night, having been prevented from sleeping by the frequent discharge of muskets and continued noise of native drums, which the inhabitants of the town below kept up without intermission until morning.

16th.—We weighed at daylight and proceeded, the river trending N.N.E. $1\frac{1}{4}$ mile, with soundings along its western bank of 5 fathoms; its width, immediately on passing the island, was about 700 yards, narrowing as we advanced to about 350, and having the bank on our left, 15 to 20 feet out of the water; it then opens N.E. about 2 miles, having an average width of 300 yards, with soundings of 4 and $4\frac{1}{2}$ fathoms. At the upper end of this reach we passed on our right a small town, and getting into shoal water immediately after, we crossed to the opposite, or eastern bank, into 4 fathoms. Continuing our course along it in 5 and 6 fathoms, we proceeded up a reach extending N. nearly $1\frac{1}{4}$ mile, having a width of about 350 yards, and rounding at its upper end largely to the eastward. In this round we passed on our left three towns, situated closely together, the inhabitants of which, generally armed, stood crowded on the bank to see us. The bank here was from 12 to 18 feet high, and indicated, we observed, a fall of about 2 feet in the river—this surprised us, and increased our anxiety to get forward. Proceeding onwards in 4 fathoms, we shortly after entered a reach extending S.E. by E. about 3 miles, 400 to 550 yards wide, and having soundings along the right bank from 2 to 4 fathoms. Probably, however, we were on the shoal-water side of the river, for on crossing near to the upper end of this reach, and continuing our course along its opposite bank, the depth increased at once to 5 and $5\frac{1}{2}$ fathoms. The river then rounded to E. three-quarters of a mile, and shortly after to N.E. by E. $2\frac{1}{2}$ to 3 miles, and narrowing a little. In the upper end of this last reach we passed on our right a beautifully wooded island about three-quarters of a mile in length, with a small town opposite to it on the right bank of the river. Turning again to the S.E., and continuing our course in 5 and $5\frac{1}{2}$ fathoms for about $1\frac{1}{4}$ mile in that direction, with an average width of 250 yards, we came to another wooded island

larger considerably than the former; and selecting the northernmost, from being the widest of the two channels formed by it, proceeded onwards in $3\frac{1}{2}$ and 4 fathoms. We passed on our left a smaller branch coming from the N.E., out of which, just as we approached it, issued a large canoe, with native flags of various colours, and seemingly belonging to one of the chiefs, or "gentlemen," of the country. The pull-away-boys on perceiving us ceased paddling immediately—their paddle-song being changed at the same time into an exclamation of surprise. Seeing us approach nearer perhaps than was consistent with their notions of security, they pulled rapidly to the bank, and leaping on shore almost in a body, disappeared instantly amongst the underwood, leaving the canoe to proceed along with the current. We passed on, without appearing to take any notice of them, and leaving behind the large island, entered a reach extending E.N.E. about 1 mile, and passed immediately afterwards a small town situated on our right.

Thus far, since starting to-day, the banks for some distance are chiefly flat and grassy, with clusters of fan and other palms, and scattered trees of the wild cotton. Numerous plants of different descriptions skirt them here and there, forming thick patches of low brushwood at intervals along the river. Behind the grassy flats, the country is thickly and beautifully wooded, having, no doubt, many useful and valuable woods amongst such an exuberant mass of vegetation. Besides the towns already noticed, we passed several small villages, chiefly inhabited by fishermen, who pursue their vocation by entrapping fish in ingeniously-contrived baskets, as already described. Yams and cocoas were the only vegetable productions that we observed to be cultivated, which, with bananas and plantains, appear chiefly to constitute the vegetable portion of the food of the natives.

Continuing our course up the last-mentioned reach (E.N.E. about one mile), with an average width of about 250 yards, we commenced to round again to the eastward, passing on our left a considerable town beautifully situated upon a grassy rising ground, and containing perhaps a population of nearly 900 inhabitants. The bank at this town rises into round grassy eminences of about 100 feet, with a few palms only scattered over their sides and summits. Proceeding onwards in 4 fathoms, we continued to wind largely to the southward, when, having opened a reach with a width of about 500 yards extending above a mile in that direction, we were agreeably surprised at seeing a range of mountains burst into view directly ahead of us. On examining them through a glass, we could perceive that they were wooded to their summits; and as we could just distinguish some palms upon a ridge to the eastward of a rounded peak in the centre, we calculated that they

might be distant from 15 to 20 miles in a direct line from us. The peak we considered could not be less than 3000 feet above the level of the river. We passed in this reach two more small towns situated nearly opposite to each other on the respective banks of the river, and, having rounded to S.W. by W., proceeded up a reach, extending about three-quarters of a mile, with soundings along its western side from 2 to 5 fathoms. As we ascended here the river narrowed considerably, having a width of no more than 120 yards in rounding into the next reach, which greatly increased, of course, the force of the current. Proceeding onwards in 4 and 5 fathoms, we continued our course up a somewhat narrow reach extending S.E. nearly 1 mile, and, having rounded again to the S., had another and more distinct view of the mountains seen before in that direction. The reach we were now in extended S. about $1\frac{1}{4}$ mile, having an average width of about 400 yards, with soundings along its western bank of 4 and 5 fathoms: the trendings then for about 5 miles are as follow—S.E. by E., 2 miles; S.S.E., 1 mile; E.S.E., 1 mile; and E. $\frac{1}{2}$ N., 1 mile also. The stream in this distance exceeds, in one reach only, a width of 300 yards; its average being about 250, and having a depth of water, generally speaking, of 4 fathoms. Both banks are thickly wooded, the northernmost one apparently rising into a low hill behind, as large numbers of fan-palms were observable from the deck of the steamer in that direction. We passed several towns, none of them however being of any size or importance; and none containing, we dare say, more than 300 inhabitants, some of whom still show themselves upon our approach armed with muskets. Continuing our course in an E.N.E. direction about $1\frac{1}{4}$ mile farther, the aspect again changes, both banks rising now into grassy hills of about 150 feet, and covered chiefly with palms and plantains, with bombax and other trees skirting the river. Proceeding onwards, the river trends about E.S.E. $2\frac{1}{2}$ to 3 miles—in short reaches 150 to 200 yards wide, with soundings from 4 to 6 fathoms. The banks, generally speaking, are a series of conical hills, rising from 150 to 300 feet above the level of the river, some of them covered with palms and other trees, while others are grassy, with a few palms only scattered over their sides and summits. On a few we observed innumerable boulder-stones, apparently of sienite, strewn about in every direction, and reminding us of similar appearances below Adda-coodah, on the Niger. A few villages likewise were observable in the valleys between, with patches of yams, cocoas, and plantains upon the sides of the hills nearest to them. Passing a small town on our left, the river next rounds to the southward and W. about 4 miles, having a width of about 250 yards, with soundings along its western bank from 4 to $5\frac{1}{2}$ fathoms. We passed on our left a large town, named Autam, which our in-

terpreter informed us was his birth-place, and from which he had been sold in early life, at the death of his father, as a slave. Farther on, we passed two small towns on our right, and rounding shortly after to S.E., and passing on our left three other towns situated closely together, the central one being large and named Ocoom, we came to an anchor for the night in $4\frac{1}{2}$ fathoms. We had not been long here when we observed two canoes put off from the landing, having each on board a *white* sheep and fowl, the latter of which was held up at arm's length to attract attention, and to indicate, we supposed, their friendly disposition. On the interpreter desiring them to come alongside, they did so, though with great caution—a feeling which increased on coming on board to positive apprehension; but their fears were soon allayed by a little kindness. On their leaving to return on shore, we desired them to say to the chief that we would see him in the morning.

17th.—Accordingly, while steam was getting up, we proceeded on shore, and found the chief, named Indomoh, waiting, with a large crowd of people, to receive us at the landing. Walking to his house, he asked us to accept of a small bullock, which we did, and made him a suitable present in return. We then let him understand that we were desirous of having an interpreter to accompany us up the river, and with much difficulty we prevailed on him to let his son go with us in that capacity; when we returned on board, and weighed. The river first opened S.S.W., then rounded largely to the eastward, and opening into an E.N.E. reach for a short distance, trended again to the E., with an average width, thus far, of 250 yards, and a depth of water from 4 to 7 fathoms. We passed on our left a sandstone cliff of about 20 feet, beside which is a small town, named by our new interpreter Icoom; and turning suddenly round to the S. and W., continued our course in that direction for about 9 miles in a serpentine manner, when, our fuel being exhausted, we anchored. The banks in this distance are densely wooded, rising on each side in a sloping manner to a height of about 200 feet.

18th.—At anchor all day, wooding. The mountains previously mentioned were seen this evening over the trees, from the mast-head, ranging from S. to W., distant apparently about 8 or 10 miles.

19th.—Weighed at daylight, and proceeded; the river still continuing to wind in a serpentine manner to the S. and E., having a width of from 150 to 250 yards, and soundings from 5 to 6 fathoms. It then winds to the E. for about 6 miles, decreasing in width from 200 to about 100 yards, though in a few places having a width for short distances of nearly 300, with both banks densely wooded. The soundings thus far are from 5 to 10 fathoms. Passing a small stream on our right, the river began to narrow exceedingly,

and to trend in short reaches of from 350 to 250 yards in length only, to the N., E., and N.E. We had great difficulty now in getting forward, the current having increased to such a degree as all but to stop the vessel's progress. At 9 h. 30 m. we entered a short reach extending about 350 yards to the northward, confined within perpendicular cliffs of sandstone, rising on each side of us to a height of about 80 feet, and having large trees depending from their summits. Here the river had a width of about 30 yards only, with such an impetuous current that the steamer (of 30 horse-power) was unable to advance any farther against it. Seeing this, and feeling besides that his vessel was now in a most perilous position (for had the current taken her upon either bow, she must inevitably have been impelled against the cliff, and have lost her masts and funnel by contact with the depending trees and large branches), Mr. Becroft gave orders to slow the engine, with the view to drop down until he found a suitable place to anchor. This, from the rapidity of the current, was done with much difficulty and danger, nor could we find an anchorage until we had descended from 3 to 4 miles.

At noon, having manned and armed the long galley, we proceeded in her to endeavour, if possible, to get beyond the rapid. On coming to the place we had reached in the steamer, we kept close by the cliff, and taking advantage of every projection and branch that could be laid hold of, succeeded in passing, but not before the kroomen had almost been exhausted from the severity and continuance of their exertions. Having rested awhile, which we were enabled to do by making fast to the projecting limb of a large tree, we again proceeded, and continued our ascent about 2 miles farther up the river. The rapid extends about half a mile altogether; or, if the term be applied to that portion of the stream confined within the precipitous cliffs, about three-quarters of a mile, in four short reaches, nearly as follows: N., about 350 yards; N. by W., 200; N.N.E., 300; and N. $\frac{1}{2}$ E., about 300 also; with a uniform width apparently of about 30 yards. Above, the river gradually opens again to about 300 or 350 yards, having soundings from 4 to 6 fathoms, and winding to the N.E. in a somewhat serpentine manner. The banks, so far as we ascended, were thickly wooded. At 6 p.m. we passed a small town on our left, situated upon a grassy eminence, the inhabitants of which, we could perceive, were preparing to attack us; and opening at the same time a wide reach extending above a mile to the N.E., we stopped, and allowed the boat to drop down leisurely with the current. On seeing us stop, the inhabitants of this small town began to fire at us, which they continued to do until we were out of sight round a turn in the river. Fortunately, the stones, or whatever else had been fired,

either dropped short, or passed harmlessly over us; and we returned to the steamer pleased, if not with the reception we had met with, at all events with what we had seen of the river.

20th.—At daylight proceeded in the boat again to examine the rapid, and to ascertain if, with the assistance of warps, the steamer could not be got above it. Perceiving that any attempt at warping would be attended with imminent hazard, and finding that the water of the river was now rapidly falling, Mr. Becroft determined to retrace his course to the coast.

21st.—On examination this morning, we found that the water had fallen during the night 19 inches. At daylight commenced wooding; and having finished at 10, we weighed and commenced our descent of the river. At 2 P.M. we reached Ocoom, and anchored for a little to land the chief's son, whom we had taken from this town in the capacity of interpreter. Having made a suitable acknowledgment for his services, we returned on board, and, weighing, continued our descent until dark, when we came to for the night in 4 fathoms.

22nd.—Weighed at daylight, and, at 1 P.M., having reached Acoono-Coono, again anchored. Do-dee (the chief) and the "gentlemen" of this place were happy to see us, and expressed a hope that we were now come to remain some time with them. It will be remembered that we have with us from the town of Omùn, lower down the river, a "gentleman" named Anna, who has been deputed to arrange, if possible, by our mediation, a quarrel of long standing with these people. With the view of introducing this subject as quietly as possible, we took the opportunity, while speaking of Omùn, to signify how sorry we were to hear that Acoono-Coono and Omùn were "bad friend," and how glad we should feel to see them "stand again proper." This remark had the desired effect, and elicited their account of the subject of quarrel. This was a disputed claim to a small hill or eminence remarkable for its fertility, situated on the E. bank of the river below Acoono-Coono, forming part of the ill-defined territory of that town and of the town of Omùn respectively; as likewise to a landing-place, to which the people of the neighbouring country generally brought their yams and other produce for sale.

23rd.—Engaged all day on shore, hearing, through our interpreter, what the chief and "gentlemen" of Acoono-Coono and Anna of Omùn had respectively to say in support of their claims to the disputed territory.

24th.—Again occupied until 2 P.M. on this question, much the same as yesterday; when, having obtained the promise of both parties to abide by our decision, we awarded—that Omùn give up all claim to that half of the eminence nearest to Acoono-Coono,

and that the landing-place shall be considered neutral ground. This arrangement having given satisfaction, the parties were sworn to abide by it; and, having first partaken of food together, as is their custom on such occasions, agreed to be friends for the future, and to resume and continue trading with each other.

25th.—On examining, this morning, we found that the water had fallen 4 feet since we anchored on the 20th, which increased our anxiety to be out of the river.

Having bid adieu to the old chief and "gentlemen" of Acoono-Coono, and accepted of a fine cow which they presented to us, we weighed at 10 A.M., and, running down to Innoo-coboh, the plantation of our passenger Anna, came to an anchor for the day to receive a present of yams which he desired to give us.

26th.—Weighed at 9 h. 30 m., and in two hours arrived at Omùn. The chief and "gentlemen" of this town, on being informed by Anna of the settlement of the "palaver" with Acoono-Coono, expressed great satisfaction, taking us by the hand, and warmly thanking us for the service we had rendered them, and further acknowledging it by presenting to us a bullock and 1000 yams.

27th.—Weighed at 1 P.M., and at 3 arrived off Etoo. Feeling unwilling again to pass this place without making an attempt to be friendly, we came to an anchor, and despatched a messenger to inform the chief that we had not come to "make war," but to be friends, and as such desired to see him. In about an hour our messenger returned, accompanied by two "gentlemen" of the place, apparently sent with a view to ascertain the truth of our message. To these we showed every attention and kindness, and on their leaving us we desired them to say to the chief that we should be on shore early in the morning, when we would expect to meet him and his "gentlemen" at the landing-place.

28th.—On landing at an early hour this morning, we were pleased to find the chief—a stout, middle-aged man—with several of his "gentlemen," waiting to receive us. The first salutations being over, we were much gratified at being requested to accept of several "dashes" which they had brought for us, and for which we made suitable returns. We then partook of some palm-wine together, and entered into conversation about their refusal to see us on our former visit. The chief acknowledged that this arose from fear of us; but now he was glad to find that "white man" was his friend, and hoped we would come back, and make trade with him.

Returning on board, and getting steam up, we weighed at noon, but had not reached Icricock before we considered it prudent to anchor on account of the shoaling of the water. On Mr. Becroft's return from sounding the channel (having found nowhere less than

11 feet, nor more than $2\frac{1}{2}$ fathoms) we again weighed, and passing Icricock without stopping, continued our descent (following the same course by which we had ascended) without interruption, into the estuary of the river; and at 6 h. 30 m. P.M. anchored off Duke's Town, having been absent 19 days on our expedition.

METEOROLOGICAL MEMORANDA, from September 7 to 26, inclusive.

Date.	Fahr. Therm. Shade.				Temp. of Water at Noon	REMARKS.
	6 A.M.	Noon.	3 P.M.	6 P.M.		
Sept. 7	74	82	82	86	76	Remarkably fine—4 P.M., rain, thunder & lightning.
8	74	84	90	74	79	Showery—6 P.M., rain, thunder and lightning.
9	76	87	86	76	80	Remarkably fine—6 P.M., rain, thunder, &c.
10	76	82	80	76	78	Ditto 6 P.M., ditto.
11	74	89	82	87	80	Sultry and fine.
12	74	82	86	79	78	Remarkably fine.
13	72	82	90	76	78	Sultry and fine.
14	74	87	80	77	80	Ditto.
15	73	84	86	78	80	Fine—8 P.M., rain continuing all night.
16	74	76	80	78	79	A.M., rain—P.M. fine.
17	76	78	78	74	76	Ditto rain at noon—P.M., fine.
18	74	80	82	78	79	Remarkably fine.
19	74	81	82	79	79	Ditto.
20	74	80	84	78	77	Ditto.
21	74	76	76	74	76	A.M., fine—P.M., rain, with a strong S.S.W. breeze.
22	72	87	90	74	80	Ditto 6 P.M., rain, thunder and lightning.
23	74	78	82	76	78	Ditto P.M., showery.
24	74	86	86	76	80	Remarkably fine.
25	73	79	82	76	79	A.M., fine—P.M., showery—6 P.M., rain.
26	74	84	80	76	80	Ditto 2 P.M., rain—4 P.M., fine.

XV.—*Report on the Country to the Eastward of Flinders' Range, South Australia.* By C. E. FROME, Capt. R.E. Communicated by Lord STANLEY.

THE most northern point at which I found water last year was near the top of a deep ravine of the Black Rock Hills, in latitude $32^{\circ} 45' 25''$, where I left the dray, and the larger portion of my party, on the 20th of July last, taking on only a light spring-cart, the bottom filled entirely with kegs containing sufficient water for our horses for nearly three days, and provisions for one month, which was as much as the cart would contain.

My object being to ascertain the boundaries of the southern termination of the eastern branch of Lake Torrens, as laid down by Mr. Eyre, and also the nature of the country between Flinders' Range, as high as the parallel of Mount Hopeless, and the meridian of 141° (the eastern limits of the province), I kept, at first, a course as near N.N.E. as the nature of the ground would admit, to ensure my not passing to the E. of this extremity of the lake, from whence I intended, if possible, to pursue a line nearly N.E., as far as my time, and the means at my disposal, would allow me, hoping to reach the high land laid down by Sir Thomas Mitchell on the right banks of the Darling, to the N. of Mount

Lyell, and thus ascertain if any reasonable prospect existed of penetrating at some future time towards the interior from thence. The continued heavy rains which had fallen for more than three weeks before my departure from Adelaide on the 8th of July, and for nearly a fortnight afterwards, had left the surface water in pools on the scrubby plains, and in some of the ravines; but, on proceeding N., it was evident that these rains had not been there so general or so heavy, though, by steering from point to point of the hills, after crossing the Black Rock Range at Rowe's Creek, I was able to find sufficient water for the horses, and to replenish the kegs every second or third day. From this spot the plains, as well as the higher lands, appeared evidently to dip away to the N.E., the barren hills all diminishing in elevation, and the deep water-courses from Flinders' Ridge all crossing the plains in that direction. In one of these water-courses, the Siccus (latitude about $31^{\circ} 55'$), whose section nearly equals that of the Murray, there were indications of not very remote floods having risen to between 20 and 30 feet above its bed, plainly marked by large gum-trees lodged in the forks of the standing trees, and lying high up on its banks, on one of which I remarked dead leaves still on the branches; and in another creek, Pasmore River (lat. $31^{\circ} 29'$), a strong current was running at the spot where we struck it (owing, I suppose, to recent heavy rain among the hills from whence it has its source), but below this point the bed was, like that of all the other creeks, as dry as if no rain had ever fallen, and with occasional patches of various shrubs and salt-water tea-tree growing in it. After crossing the low ridge above Prewitt's Springs, lat. $31^{\circ} 45'$, forming the left bank of the basin of the Siccus, the plain extended between the N. and E. as far as the eye could reach, and the lurid glare on the horizon, as we advanced northward, plainly indicated the approach to Lake Torrens, which, from the direction I had followed, I expected to turn about this point. I was obliged, however, to continue a northerly course for the sake of water, which I could only hope to find in the ravines of the hills on our left, as high as the parallel of $30^{\circ} 59'$, where the lake was visible within 15 or 16 miles, and appeared from the high land to be covered with water, studded with islands, and backed on the E. by a bold rocky shore. These appearances were, however, all deceptive, being caused solely by the extraordinary refraction, as, on riding to the spot on the following day, not a drop of water was to be seen in any direction. The islands turned out to be mere low sandy ridges, very scantily clothed with stunted scrub on their summits, and no distant land appeared anywhere between the N. and S.E., though, from the hills above our camp of the previous night, I could discern, with the aid of a very powerful telescope, a ridge

of low land, either on the eastern side of the lake, or rising out of it, distant at least 70 miles, rendered visible at that distance by the excessive refractive power of the atmosphere on the horizon. A salt crust was seen at intervals on the surface of the sand at the margin of the lake, or, as it might be more properly called, the desert; but this appearance might be caused either by water brought down by the Siccus, and other large water-courses, spreading over the saline soil in times of flood, or by rain, and appeared to me no proof of its being ever covered with water for any length of time. A few pieces of what appeared drift timber were also lying about its surface. The sand, as we advanced farther E., became more loose and drifting, and not a blade of grass or any species of vegetation was visible, rendering hopeless any attempt to cross it with horses. This point of the lake shore being, by Mr. Eyre's chart, about 30 miles to the westward of where I found it, I thought it advisable to push farther N. in the direction of the highest point of the range, which I imagined was probably his Mount Serle; for though it was not to be expected that Mr. Eyre, whose principal and almost sole object was the discovery of a road into the interior, would, at the same time, have been able to lay down the position of his route with the same accuracy that might have been expected from a surveyor, this difference of longitude prevented my being certain of the identity of the spot, or that the range on our left might not, after all, be another long promontory running to the N., similar to that on the western side of which was Mr. Eyre's course. The appearance of the country, however, from the hills close under Mount Serle (for the perpendicular cliffs on the E. side of this range of hills prevented my ascending to their summit without turning them among the ranges, for which I had not then time) convinced me at once, from its perfect accordance with the description given by Mr. Eyre, that his eastern arm of Lake Torrens was the sandy desert I had left, its surface being about 300 feet above the level of the sea; and, our two converging lines having thus met at Mount Serle, I knew it was useless to advance farther in the same direction, to a spot which he had named—from the impossibility of proceeding beyond it—"Mount Hopeless."

I was thus forced to return to Pasmore River, as the nearest point from whence I could cross to the low hills to the eastward, S. of Lake Torrens, and from thence I sent back to the dépôt two men of the party and three horses, the former for the sake of their rations, and the latter on account of the probable difficulty I should have in procuring water, taking on with me only Mr. Henderson and Mr. Hawker, on foot, with the light cart and one policeman. The second evening I made the most

northern of these hills, but could not find a drop of water in any of them, and, having unluckily lost the policeman, who had crossed in front of the dray and got entangled in the dense scrub, I was detained three days riding upon his tracks, until I had traced them to our dray tracks from the depôt at the Black Rock Hill, which he reached in safety after being out 5 days without food. The cart, in the mean time, had been obliged to leave the spot where I had left it for want of water, having been out 6 days without obtaining any but what we carried in the kegs; and when I overtook it, we had not sufficient provisions for another attempt, the period of one month, for which they were intended to last, having already nearly expired.

I very much regret not having been able to reach, at all events, within sight of Mount Lyell; but where I turned I could plainly see the whole country within 50 or 60 miles of the boundaries of the province, and can speak with almost as much confidence of its absolute sterility as if I had actually ridden over it. It would certainly be possible in the wet season to take a small party from Prewitt's Springs across to this hill of Sir Thomas Mitchell's (distant about 160 miles), by carrying on water for 8 or 10 days; but no further supply might be found short of the Darling (80 miles beyond Mount Lyell), on which river it would be madness to attempt anything without a considerable force, on account of the natives; and the same point might be reached in nearly as short a time, and with much more certainty, with any number of men that might be considered necessary, by ascending the Murray as high as the Laidley Ponds, and by proceeding N. from thence.

On returning to the depôt, I moved the party down to Mount Bryan, and made another attempt, on the 25th of August, with Mr. Henderson and one man leading a pack-horse, to the N.E., hoping, from the heavy rains which had fallen during the past two months, to find sufficient water in the ravines to enable me to push on for several days. The second day I crossed the high range I had observed from the Black Rock Hill and Mount Bryan, for the southern termination of which Colonel Gawler steered when he left the northern bend of the Murray in December, 1839; but though these hills had an elevation of 1200 or 1400 feet above the plain, there was no indication of rain having fallen there within any definite period of time. This want of water prevented my proceeding farther to the N.E.; but from the summit of the highest of these hills (Mount Porcupine) I had a clear view of the horizon in every direction, and a more barren, sterile country cannot be imagined.

The direction of the dividing ridge between the basin of the Murray and the interior or "desert plain, was generally about

N.E. from the Black Rock Hills (the highest point N. of Mount Bryan), gradually decreasing in elevation, and, if possible, increasing in barrenness. The summit of these hills I found invariably rock, generally sandstone; the lower slopes covered with dense brush, and the valleys with low scrub, with occasional small patches of thin wiry grass. I was obliged to return on the third day, and reached the foot of Mount Bryan on the fourth evening, at the southern extremity of which hill the horses were nearly bogged in the soft ground.

It appears to me certain, from the result of these different attempts, that there is no country eastward of the high land extending N. from Mount Bryan as far as Mount Hopeless, a distance of about 300 miles, as far as the meridian of 141° (and probably much beyond it), available for either agricultural or pastoral purposes; and that, though there may be occasional spots of good land at the base of the main range, on the sources of the numerous creeks flowing from thence towards the inland desert, these must be too limited in extent to be of any present value.

The nature of the formation of the main range I found, generally, ironstone-conglomerate and quartz, with sandstone and slate at the lower elevations. At the points of highest elevation, from Mount Bryan northward, igneous rocks of basaltic character protruded from below, forming rugged and fantastic outlines.

At one spot, particularly, about lat. 31° , there were marked indications of volcanic action, and several hollows resembling small craters of extinct volcanoes, near one of which we found a small spring of water maintaining always a temperature of about 76° Fahrenheit, when the thermometer standing in water in the kegs stood at 52° , and in the atmosphere at 54° .

The accompanying sketch of the country from Mount Bryan northwards, will probably explain its character better than any written description. The altitudes, marked at the different spots where they were observed, were obtained by the temperature of boiling water, as observed by two thermometers; but, as they were not graduated with sufficient minuteness for such purposes, the results can only be considered approximate.

ANALYSES.

I.—*Preussen's See-Atlas*. Published under the direction of His Excellency Privy Councillor BEUTH. Berlin, 1841-4. Communicated by Captain WASHINGTON, Royal Navy.

EMULATION and rivalry in the arts of war have, happily for the civilization of mankind, given place to more honourable rivalry in the arts of peace, and in science; and of peaceful occupation perhaps there is none of more importance, none that is of more direct practical benefit to our fellow-creatures, than the silent and steady labours of the hydrographer.

The surveys of the coasts and adjacent seas of England, France, Holland, Denmark, and parts of Sweden, Norway, and Russia, have been slowly yet unceasingly going on during the last quarter of a century, and a portion of the results of many of them is published; yet amongst these it would be difficult to select one that for accuracy and completeness of detail and for beauty of execution can surpass the specimen of the Prussian *See-Atlas* which we have now before us.

The great value of an accurate survey of the Baltic to every maritime nation must be manifest to all, but much more so to England, not only since her commercial marine is the main source of the wealth of the country, but also from early associations intimately connected with that sea. Time was when the 'Baltic Trade' and the 'Baltic fleet' were terms 'familiar as household words' to our ears, and a British sailor, independently of other considerations, can never cease to feel a deep, an undying interest in the scene of the earlier exploits of England's cherished hero—Nelson.

Yet, happily, these scenes are now witness of a more honourable strife—a strife in the advancement of science; and although, in the opinion of some, scientific pursuits, and especially in the higher branches of science, may be regarded as more a matter of curiosity than of utility, yet—albeit we may lay ourselves open to Molière's witty remark, "*Vous êtes orfèvre, Monsieur Jasse*"—surely it will be conceded that the labours of the surveyor have claim to the epithet of useful; and if, as has been well observed, 'the man who points out in the midst of the ocean a single rock unknown before is a benefactor of the human race,' how much more are they entitled to this praise who furnish the navigator

with an accurate and practical chart of a large portion of a sea so much frequented by shipping of all nations as the Baltic!

The tract of country described in the survey before us is the northern coast of Pomerania and Prussia, comprising nearly the whole extent of the south shore of the Baltic, or 'East Sea' as it is there usually called, from Stralsund and Rügen on the west, to Memel on the east; an extent of about 350 miles, direct distance, including the ports of Stettin, Danzig, Pillau, Königsberg, and Memel; and although a tolerably accurate impression exists, we believe, as to the amount of trade connected with those ports and the Baltic generally, still it may not be without its use, before entering upon the more immediate description of the survey, to place before the reader some statistics on this point, especially as, thanks to the kindness of the Chevalier Hebel, Prussian Consul-General in London, we have the opportunity of supplying them from authentic sources.

The total number of ships which passed the Sound up and down was—

	Ships.	British Ships.
In the year 1842 . . .	13,957	3520
In the year 1843 . . .	14,947	3518

And in each of the years 1825 and 1827, 5150 British ships.

In 1838 the number of British ships lost within the Baltic was 13 ships of 3043 tons. so that the value of good charts, were it only for the sake of our own interests, is manifest.

The arrivals and sailings of these vessels in 1843 at the chief Prussian ports were as follows:—

	Arrivals.	Sailings.
Pillau and Königsberg . .	1560	1552
Danzig	1468	1450
Memel	733	730
Stettin	1765	1664

Now this amount of traffic, nearly 15,000 vessels yearly, it is to be remembered, is only the external trade of the Baltic; its internal shipping includes the navies of Russia, Prussia, Sweden, and Denmark, and all the international commerce of these several countries, so that it may safely be affirmed that with the exception of the seas immediately surrounding the British Islands, and possibly the sea-board of the empire of China, no portion of the ocean is so much frequented by ships as the Baltic Sea. Of how much greater importance then does an accurate examination of these seas become to all maritime nations!

The basis on which the survey of the southern shore of the Baltic depends is a triangulation carried over the kingdom of

Prussia in the years 1833-9, by the officers of the Prussian Royal Staff Corps; and in order not to lose the advantage of the fixed points and beacons established in the course of the land-survey, the Prussian Government, at the instance of Privy Councillor Beuth, directed the coast-survey to be proceeded with at the same time, and confided its direction to Herr von Bille, Director of the Royal Naval School at Danzig, assisted by Captains Albrecht, Will, and Domcke, with his brother F. Domcke. In the year 1837, in consequence of Von Bille's retirement from the service, the command devolved on Captain Albrecht, who brought the survey to a close in 1838.

The introduction prefixed to the Atlas of views and lighthouses, which forms a part of this work, details very minutely the means placed at the disposal of the surveyors, namely, small vessels and boats; and the method of taking their soundings and fixing their position, either by angles between three fixed objects on shore, or, when the third could not be seen, by an angle and an astronomical bearing; thus very properly trusting nothing to compass bearings, so liable to error, and which, as is well-known, deviate variously from the truth according to the direction of the ship's head. The coast-line and the soundings were then laid down on the working scale of $\frac{1}{15117}$ of the scale of nature, or 3 inches to the nautic mile nearly,—and reduced for engraving and published on one-fourth of the above scale, or $\frac{1}{15117}$, or $\frac{1}{4}$ ths of an inch to a nautic mile. The soundings extend off shore about 2 German or 8 English miles, and are given in fathoms, except within the 3 fathom line, when they are marked in feet.

In this manner were completed the twenty sheets of coast charts, and two general sailing charts, extending from near Polangen in Curland, a little north of Memel, on the east, to Ribnitz, a few miles to the eastward of Rostock in Mecklenburg, a distance, including the windings of the coast, of 600 geographic miles.

The prevailing feature of this tract of coast is low sandhills and dunes, with occasionally a shingle beach of pebbles of granite, porphyry, and flint, which, near Dobberan, to the westward of Rostock, are heaped up into long low hills or walls, of some extent.

The town of Rostock, with its lofty spire of St. Peter's, 420 feet high, stands on an eminence on the south side of the river Warnow, which here expands to a width of 800 yards, and forms the harbour, having 8 feet of water up to the quays. Its trade is chiefly in corn and wool; and it has 160 vessels belonging to the port. Population, 18,500. The entrance at Warnemünde, at 6 miles' distance, is marked by a light 58 feet above the sea. Hence the coast extends, in a north-eastern direction, 25 miles

to Darrser Ort, a low wooded point, $3\frac{1}{4}$ miles to the eastward of which lies the Prerow Bank, having only 11 feet water on it. Darrser Ort is the nearest point of Prussia to the coast of Denmark, lying only 20 miles E.S.E. of Giedser Odde, the south extreme of the island of Falster, whence extends, 5 miles, in a south-easterly direction, the dangerous Trindelen reef, marked by a red buoy. The greatest depth between these shores is 13 fathoms, on mud.

From Darrser Ort the coast turns abruptly east, for 20 miles, to the island of Rügen. This, the largest of all the islands belonging to Germany, has an area of about 320 square miles. It is separated from the Continent, to which it is supposed to have been formerly joined, by a shallow strait about one mile wide. The shape of this picturesque island is very irregular, being deeply indented by the sea, which, combined with its internal lakes, forms a number of peninsulas united in the centre. Of these, the most remarkable is Jasmund on the north-east, connected with the main on the south by a long narrow ridge of granite and porphyry boulders, called the *Prora*. This peninsula is composed of lofty chalk cliffs of most grotesque forms, the highest point, called the *Königstuhl*, or King's Chair, rising about 550 feet above the sea.* On the north-west Jasmund is joined by a narrow strip of sand (*die Schafe*) to the peninsula of Wittow, terminating in the promontory of Arkona, marked by a brilliant light at 203 feet above the sea.

Rügen is a fertile island, level to the west, but rising gradually, to the north and north-east, into rugged chalk cliffs. The number of cattle is considerable; the fisheries productive; and water in abundance. The population is 30,000; and they are famed for their hospitality and kindness to shipwrecked sailors. To the honour of the country, several ancient laws are still in force respecting wrecks, which are immediately taken charge of by government officers; and thus the disgraceful scenes, of so common occurrence nearer home, are avoided.

On the south shore of the narrow strait of Gellen, which separates Rügen from the main, are the small ports of Stralsund and Greifswald. Stralsund, conspicuous by its lofty steeple of St. Mary's, is surrounded by water. It has a tolerable and safe harbour, with depth for vessels drawing 15 feet, but of difficult access. Its trade is considerable, and it has 100 vessels belonging to the port; its population, 17,500. Greifswald has 60 vessels, with a population of 8000 persons. On the small island called Greifswalder Oye, at the eastern entrance of the strait, are two

* It is to be regretted that the heights of all the eminences above the sea are not given in the Prussian sailing-charts.

lights, at an elevation of 90 feet above the sea, to mark the channel.

From Arkona to Jershöft, a distance of $108\frac{1}{2}$ geographic miles, the coast forms a bay 3 miles deep, including the ports of Wolgast, Stettin, and Swinemünde. The depth of water in the western half of this bay does not exceed 15 fathoms; in the eastern half it reaches to 30 fathoms. At 18 miles N.N.E. of Swinemünde lies the Oder Bank, an extensive flat of 5 and 6 fathoms, but having in one spot only 17 feet. A little without this bay, and half-way between the islands of Rügen and Bornholm, lies the extremely dangerous shoal called the Adler's Grund, with only 14 feet water; it is distant $33\frac{1}{2}$ miles in an E. $\frac{1}{2}$ S. direction from Arkona light. Mariners should be specially on their guard against these two dangers, which ought to be marked by large beacon-buoys, if not by light vessels.

Stettin, one of the most flourishing commercial towns, and one of the strongest fortresses in the Prussian monarchy, stands on an eminence on the left bank of the Oder. Its population is 35,000; and its trade considerable, 1765 vessels having entered during the year 1843, and 1664 cleared outwards. Ships are built here, and anchors manufactured for all the Prussian marine. Here is also an observatory and a school of navigation.

The Oder, rising on the frontiers of Moravia and Gallicia, bathes the walls of Breslau and Frankfort, receives many tributaries, and after a general north-north-west course of 350 geographic miles, flows past Stettin, where it divides into four branches, which discharge themselves into a large lake called the Grosse Haff; this again communicates with the Baltic by three channels, which form the two level wooded islands of Usedom and Wollin.

The Stettiner Haff, one of those remarkable shallow fresh-water lakes which line this coast, has an area of 180 square miles; in the eastern half the general depth is about 18 feet, and it is here that the passage lies from Stettin to the sea at Swinemünde, a distance of 39 miles by an intricate navigation, but carrying a depth of 12 feet water throughout.

Swinemünde is a small town, of 4000 inhabitants, but important from its situation at the mouth of the Swine. Since the year 1817 the harbour has been much improved by removing the bar and running out piers, which have secured a depth of 21 feet up to the town; there is a light on the eastern jetty head.

At Jershöft the cliffs are about 70 feet high, and here is exhibited a revolving light 165 feet above the sea, visible from 18 to 20 miles in clear weather. The coast from this point convexes to the northward for 66 miles as far as Rixhöft, a cliff 170 feet high, and the northernmost point of Prussian Pomerania. At

Ramkal, about 25 miles to the eastward of Jershöft, between the Gardener and Leba See, the hills rise to a height of 360 feet. From Rixhöft the land turns abruptly to the south-east and forms an extraordinary tongue of low sand, 18 miles long by $\frac{1}{4}$ mile broad, terminating in the well-known Hela of Danzig, marked by a revolving light 130 feet high.

Rixhöft and Cape Brüster Orth are the boundaries of the gulf bay of Danzig, 33 miles deep and 100 miles in circuit. At its outer part this bay has a depth of water of 60 fathoms, gradually decreasing to 30 fathoms, which it preserves to within less than 4 miles of the beach in the very bight of the bay, and, yet more singular, to within half a mile of Hela Point, which, therefore, although its surface is barely a few feet above the water, rises almost precipitously from a depth of 200 feet—thus having the steep sides and ridge-like form which characterize the North Sea banks: here, however, it will be remembered, there is no stream or tide.

Danzig, or Gdansk, a first-class fortress, and the chief port of Prussia, stands on the left or south bank of the Vistula or Weichsel, about $3\frac{1}{2}$ miles from its outlet at Weichselmünde, in the south-west corner of the Gulf. This is the well-known great mart of Prussian trade in corn, wool, timber, flax, and hemp. The exports of wheat are greater than from any other port in the world; and in 1843 not less than 1470 vessels arrived, and as many departed, from the port, one-third of which, or 576, were bound to Great Britain. Here are yards and slips for building, a royal school of navigation, and an observatory. Population, 65,000.

The Vistula, Wisla (Polish), Weichsel (German), one of the chief European rivers, and the principal river of Poland, rises at the northern foot of the Carpathian mountains near the frontier of Bohemia and Galicia, and not far from the sources of the Oder. It flows by the ancient capital Cracow, Warsaw, and Thorn, and after a course of 500 miles in a general north direction, during which it receives numerous tributaries, including the Bug, its main branch passes Danzig and falls into the Baltic at Weichselmünde. The Vistula becomes navigable by large barges at Cracow, 430 miles from the sea, and it is the great channel for the conveyance of the productions of Poland to the Baltic.

At 20 miles to the eastward of Danzig commences another of those remarkable physical features so peculiar to this coast, the Frische Haff, a shallow fresh-water lake, its depth in no part (we learn from the chart before us) exceeding 12 feet, and only separated from the sea by a narrow, low, sandy ridge or *nehrung*, 38 miles long by less than 1 mile broad. The extreme length of this haff from Elbing on the south west to the mouth of the

Pregel, near Königsberg, in the north-east, is 50 miles, and its average width 5 miles, comprising an area of 250 geographic miles. At the north-eastern extremity of the nehrung is an opening to the sea by a narrow strait or gat, 12 feet deep and half a mile wide, which is said to have been formed by an inundation of the haff in the beginning of the sixteenth century; on its opposite or north-eastern side stands the modern town and harbour of Pillau, which, owing to the shallowness of the haff, thus becomes the port of Königsberg, about 22 miles to the eastward, and Elbing 35 miles to the south-west, both within the lake. At this thriving little port, with 4000 inhabitants, vessels of heavy burden unload or lighten of a part of their cargoes. In the year 1843, 1560 ships entered, and 1552 sailed, including those for Elbing and other places on the haff: 430 of these were British.

Königsberg, the capital of Prussia Proper, with a population of upwards of 65,000, is situated on the small river Pregel, which falls into the north-eastern angle of the Frische Haff, about 4 miles below the city. Its chief trade is in corn, hemp, and flax. Here is a university and an observatory, which latterly has attained deserved celebrity from the astronomical observations of Professor Bessel. The port of Elbing, with its 25,000 inhabitants, and a flourishing trade, Frauenberg, the burial-place of Copernicus, and Braunsberg, with a population of 10,000, lie on the southern shore of this haff.

It is on the sea-shore of this long narrow nehrung, and along the coast as far as Cape Brüster Orth, that amber is found in such large quantities. It is a royal monopoly, and the beach strictly watched to save pilfering. Much of it is obtained from digging the ground at some distance from the sea, as well as that thrown up by the waves, and especially at Gross Hubenicken, about 4 miles south of Cape Brüster Orth.

From this Cape, where are two fixed lights, the higher 143 feet above the sea, the coast trends east for 18 miles to Cranz, whence begins a third, and the largest, of these remarkable low, narrow, sandy tongues or nehrungs, which separates another large fresh-water lake, called the Curische Haff, from the sea. It extends in a N.E. by N. direction to Memel, a distance of 52 miles in length, by $1\frac{1}{2}$ mile in average breadth; this strip of land is almost entirely destitute of vegetation, but has a few hamlets on it. The Curische Haff is about 53 miles long, with an average width of 9 miles, and contains an area of 470 geographic square miles; it is shallow, the bottom is very irregular, and the navigation precarious. It receives the waters of the three small streams, Dange, Minge, and Memel. Labiau, with 3000 inhabitants, on its south shore, is the only place of any importance on

its banks. At its north-eastern extreme it is connected with the sea by Memel Deep, a passage about 300 yards wide, and 12 feet deep; this forms the anchorage and port of Memel, which stands on its eastern shore.

Perhaps the most singular feature connected with these large fresh-water lakes is the rapid descent of the bank almost immediately outside the low sand ridge which separates them from the sea. For many miles into the interior of this part of Prussia the country is quite flat, and this level it preserves to the nehrung or sand-ridge, when it abruptly falls (in the bight of the Gulf of Danzig, for instance) 10 fathoms at 1 mile, 20 fathoms at 2 miles, and to 40 fathoms at only 5 miles off-shore; and the same remark holds good off the northern part of the Curische Haff.

It is difficult to imagine a ridge of sand similar to these nehrungs; but to those acquainted with the eastern coast of England, if they could picture to themselves the low sandy point of Landguard in Suffolk, extending from Harwich to Yarmouth, at a distance of from 10 to 20 miles off-shore, or the sands which line the coast of Norfolk permanently raised above water, it would give some notion of the Curische nehrung in its extent of 50 miles.

Memel, the most northern town in the Prussian dominions, situated at the north-eastern extremity of the Haff, has about 9000 inhabitants, and is the central point of the Baltic timber trade, the produce of the forests of Lithuania. The arrivals in its port, in 1843, were 733 ships of 132,000 tons burthen, of which about 70 vessels were British. The channel into the harbour is buoyed, and has on its north-eastern side a light at 98 feet above the sea. At 12 miles further north we reach the Russian frontier at Polangen.

Such, then, is the description of 600 miles of the sea-coast of Prussia, in which we may seem to have entered into far too much detail; but when we remember that it is only now for the first time we have an accurate delineation of this coast—that its headlands, harbours, and remarkable haffs are only now correctly represented—we may perhaps be pardoned for a desire to enrich our Journal with accurate geographic data which are not to be found elsewhere. A few words on the nature of the survey, and on the peculiar features of the Baltic Sea, will close our notice.

The Baltic is an internal, or mediterranean sea, of very irregular figure, which occupies, as it were, the centre of northern Europe: from Swinemünde, at the entrance of the Stettiner Haff, about the most southern point, to Torneo, in the north, its length is 770 geographic miles; while its width, from Karlsrona to Memel, is not less than 180 miles. Its whole area, including the

gulf, is about 125,000 square miles geographic, or little less than the North Sea, which may be taken in round numbers at 150,000 square miles. But the basin of this sea—that is, the surface it drains—is of vast extent. On the south, as we have seen, it receives by the Oder and Vistula the drainage of countries on the frontier of Bohemia and Galicia, upwards of 300 miles direct distance from its shores. On the east the Dña and the Niemen extend nearly an equal distance; while round the Gulfs of Finland and Bothnia the watershed is about half this distance from its shores; from the latter innumerable mountain torrents rush into the sea, which altogether is said to receive the waters of 250 streams. Its basin thus appears to be nearly as extensive as that of the Black Sea, and may be taken roughly at 550,000 square miles—between four and five times the area of the Baltic, or more than one-fifth of the surface of Europe.

This quantity of fresh water naturally decreases the saltness of the Baltic, which is found to be in the proportion of 40 to 75 of the same quantity of water in the North Sea. Its comparatively small depth may also be partly attributed to the same cause, as the rains bring down large quantities of detritus, which is gradually spread over its bed. In no part of the southern portions of the Baltic, as far as the parallel of Memel, does the depth exceed 50 fathoms, while to the westward of Bornholm it never reaches 30 fathoms. In the more northern parts it deepens to 100 and 120 fathoms.

This brackish state of the water, its little depth and want of tide, will account for its shores and straits being covered with ice for four months of the year, which is a great interruption to navigation. Yet, although the Baltic has no tides, it is subject to periodical risings of the waters to the extent of 2 and 3 feet, which is attributed by Schulten to the changes in the atmosphere, similar to the *seiches* on the Lake of Geneva. But this phenomenon has hardly yet been explained in a satisfactory manner.*

The book of views, &c. forming part of the *See-Atlas*, has for a frontispiece a sheet of the various lighthouses along the coast, admirably engraved, and so grouped as to form quite a pretty picture. The views are chiefly taken by Captain Will, at distances of 8 and 16 miles off-shore, and are very characteristic of the low line of coast, where a town is known by the sails of the

* Might we venture to suggest that, as far as the southern shores of the Baltic extend, it would form a fit pendant to this beautiful survey, if the Prussian officers would carry a series of levels, and place well-defined marks at the water-level along some of their cliffs. The isle of Rugen at Arkona, Jershöft, Rixhöft, and Cape Bruster Orb, would seem to offer excellent spots for such a work. A few years' accurate observations, in concert with good meteorological data, would, we doubt not, soon throw some light on these periodical risings of the Baltic.

windmills and the steeples of the churches rising in the horizon from the sea when no land is visible. Before the publication is complete we hope to see both lighthouses and views transferred to the charts themselves, where they would be far more useful.* Special plans, too, of the different ports, as Stettin, Danzig, Pillau, and Memel, on a very much larger scale than the coast charts, with brief sailing directions annexed, might with great advantage be inserted in the blank spaces. A chart should if possible contain everything that the mariner may require without having occasion to turn to a second document.

The soundings laid down in the sailing charts are, we presume, merely temporary tracks till more leisure can be afforded for a thorough close and systematic sounding of this sea, which absolutely demands it; when, for instance, we meet with a Middle Bank such as that between Oland and Rixhöft, with only 7 fathoms' water in one spot, at a distance of 50 miles from the nearest land, it is not enough to leave such a space of shoal water, upwards of 10 miles square, with but a single track of sounding over it. Did such a bank exist in the middle of the North Sea, not a cable's length of it in any direction would be allowed to escape without a cast of the lead upon it. In deep water such close sounding is hardly requisite; but we see here blank spaces upwards of 40 miles square, and within 20 miles of the Prussian coast at Brüster Orth without a single sounding! This is not safe, nor is it just towards sailors. From some experience in coast and deep sea sounding, we would venture to recommend, as far as possible, to sound in lines or sections at right angles to the coast—such a mode of sounding is far more likely to detect shoals or irregularities in the bottom of the sea than any other, as they usually assume a direction parallel to the shore, and always so in a tide's-way. We are aware that this plan is difficult in a sailing vessel, but with attention much may be done. Let us hope that when these charts are finished, the rest of this sea, so important to mariners, may be thoroughly examined in a steamer, which will be found a more efficient and a far more economical mode of surveying than in a sailing vessel, and will do more than double the work. Better practice for the young cadets at the naval school at Danzig can hardly be imagined; and their employment in the survey already before us is a proof that they are deserving of such encouragement.

We may also, perhaps, be permitted to suggest the employment of a small vessel with a taunt mast, say 100 feet, as a stationary beacon, and that her position be once carefully fixed

* As, for instance, in the Danish chart of the Skagerrak and other beautiful charts, for which the Geographical Society is indebted to its indefatigable honorary member Captain Zahrtmann, of the Danish Royal Navy, and Hydrographer.

either by angles from the shore or by astronomical observations—and then, that the sounding vessel describe a circle round her of about 9 miles diameter, keeping within the limit of the horizon, and measuring the distance from the pivot vessel with the *Rochon*, or micrometer telescope. This method is simple, expeditious, and far more correct than continually fixing one's position at hazard by astronomical observation in a climate where refraction plays such tricks that it is difficult to measure a common altitude of the sun within some miles. In proof of this, hear what the Prussian surveyors say themselves:—

'At each observation the inclination of the horizon towards the visible horizon was ascertained by means of the dip-sector after a due series of observations, and taken into account. There was a constant difference between the dip taken by observation and that given in the tables; the former was generally less, and upon some of the early voyages there was even a difference of 7 minutes! Had this instrument failed, all observations on the altitude of the sun would have been liable to mistake, which by its use was remedied.'—p. 9.

A doubtful remedy, we fear; however, there was no alternative: yet we must take warning by it to be careful how we trust to meridian altitudes of the sun in these seas, and would recommend the navigator to depend more upon latitude by the mean of several stars by night, when the atmosphere is less troubled.*

We are glad to see that the deep-water soundings are given in fathoms, and not, as we have lately seen elsewhere, in feet or *mètres*. Why should not all nations agree in the use of the fathom for recording deep-water soundings? Charts should speak a universal language; the fathom is a measure which all have:—the French have their *toise*, the Spaniards and Portuguese their *braza*, the Germans their *faden*, the Dutch *vadem*, the Danes and Norwegians the *favn*, and the Swedes the *famn*; all pretty nearly the same measure: then why puzzle ourselves with the French *pied*, or indeed *mètre*; or the Dutch *palmen* of 4 inches, to measure the depths of the ocean?

We rejoice, too, to see that *magnetic* compasses and magnetic bearings are given on the charts. This is as it should be; the use of *true* meridian compasses and true bearings, &c., is both unseamanlike and puzzling; all should be magnetic. What does

* Captain W. F. W. Owen found on one occasion, in observing a star's altitude, a change of 4' in the place of the sea-horizon, within the tropics, soon after sunset. Mr. Fisher observed a variation in the place of the horizon of 18' in the arctic regions. In summer the ice-horizon was elevated, not depressed; in the winter it was depressed several minutes. (*Appendix to Capt. Parry's Voyages in 1821-3*, p. 187).—A table for correcting the apparent place of the sea-horizon for the difference of temperature of the sea and the air, according to the height of the eye, would be useful; but there are scarcely any data for the construction of such a table, and the theory itself appears not to be complete.—*Raper's Practice of Navigation*, 2nd Edit., p. 40. An excellent and thoroughly practical work.

the sturdy Danziger who runs a cargo of timber or corn to the Thames, or the equally hardy collier from Newcastle, who carries a cargo of coals to Stettin, know of the *true* meridian? and yet it is for persons of this class that charts and sailing directions must and ought to be prepared. All finely-dotted outlines of shoals, all small figures and faint impressions of soundings which look pretty in the closet, all *true* meridian compasses and bearings, are but the veriest mockery to the sailor, who, perhaps, in a gale of wind is often obliged to lay off his track by night, probably by the light of a half-trimmed lamp! Charts and sailing directions cannot be too clear, brief, plain, and practical, and such as a sailor in the hour of need may turn to with confidence. And such, we feel assured, will be the sailing directions for the Baltic Sea—a fit companion to the charts before us, and both worthy of the Government under whose fostering care they are published, and an honour to the countrymen of a Ritter and a Humboldt.

II.—*Report on an Exploration of the Country lying between the Missouri River and the Rocky Mountains on the line of the Kansas and the Great Platte Rivers.* By Lieut. J. C. Fremont, of the Corps of Topographical Engineers. Washington. Printed by order of the United States Senate. 1843. Communicated by Thomas Falconer, Esq., of Lincoln's Inn.

THIS survey includes a considerable district between 39° and 43° N. lat., and 96° and 111° longitude W. It was undertaken by the order of the Government of the United States, with the ultimate object of erecting forts for the protection of traders across the country lying between the state of Missouri and the Pacific Ocean. The work of the expedition commenced at Choteau's trading-post, on the right bank of the Kansas, and ten miles above its mouth, in long. $94^{\circ} 39' 16''$ W., and lat. $39^{\circ} 5' 57''$ N.: the elevation above the sea at this point being 700 feet. The instruments carried,—unfortunately only part of the distance,—were a circle and sextant of Gambey of Paris, a sextant of Troughton, two chronometers and barometers. One of the chronometers became useless; and it is to be regretted that Lieutenant Fremont did not himself occasionally rate the one he carried with him. The rating of a watch-dealer at New York may be perfectly correct, but no traveller wishing to determine correctly the longitude of places by such an instrument could entirely depend on the rate at starting. The survey of Mr. Schomburgk in Guayana is an example to all travellers of attention to accuracy in this respect, and of what they can accomplish, in the midst of great difficulties, by care and habitual correctness. The party were fully under weigh to the west on the 10th of June, 1843, taking

meritorious proceeding. The meteorological tables extend over only a part of the journey.

A short period will, no doubt, produce much additional information of these districts; but it cannot be forgotten that all journeys in this part of the world are accompanied with great privations; that the carriage of instruments is painful and laborious; the heat of the climate oppressive; and that a separation from companions, though often unavoidable, is an event of constant danger.

The following are some of the principal points at which Lieut. F. made observations for latitude and longitude, referred to the meridian of Greenwich:—

	Latitude.			Longitude.		
St. Louis, Col. Brant's house	38°	37'	34"	90°	15'	55"
Choteau's trading-post	39	05	57	94	39	31
Junction of the N. and S. forks of the Platte River	41	05	05	101	21	24
St. Vrain's Fort	40	22	35	105	45	13
Fort Laramie	42	12	10	105	21	10
Highest peak of the Wind River } Mountains, between }	42	49	49	110	37	25
Missouri River—mouth of the River Kansas	39	06	03	94	32	54

III.—*Commerce of the Prairies, or the Journal of a Santa Fé Trader, during eight Expeditions across the Great Western Prairies, and a Residence of nearly Nine Years in Northern Mexico. Illustrated with Maps and Engravings.* By Josiah Gregg. 2 vols. New York. 1844. Communicated by Thomas Falkoner, Esq., of Lincoln's Inn.

THIS work gives much information respecting Santa Fé and the district of New Mexico in its neighbourhood. The greater portion of it is occupied with particulars of the journeys made over the vast unsettled regions lying between the Mississippi and the Rio Grande del Norte, and of the trade between the United States and New Mexico, but it contains many interesting geographical facts which deserve notice.

Mr. Gregg states, that the only paper found in the archives of Santa Fé giving any information of the settlement of New Mexico, is a memorial of Don Juan de Oñate, a citizen of Zacatecas, dated September 21, 1595. It asks permission of the viceroy to establish a colony on the Rio del Norte, in the country already known by the name of New Mexico. From the memorial it appears that an adventurer, Francisco de Leyva Bonillo, with some followers, had previously entered the province without permission, whom Oñate was authorised to arrest and punish. Mis-

sionaries are said to have visited it in 1581; and there is a tradition that the first settlement—perhaps that of Bonillo—was made in 1583.

The public archives of Santa Fé contain the journal of Don Antonio de Otermin, relating a remarkable conspiracy among the native tribes to massacre the Spanish population on the 13th of August, 1680. Information of the conspiracy was obtained, but the Spaniards were attacked, and the governor and the surviving Spaniards were compelled to retreat to Paso del Norte. In the following year Don Diego de Vargas Zapata commenced the reconquest of the country. The war lasted ten years. In 1688 Don Pedro Petrir de Cruzate entered the province, and reduced the Pueblo of Zia, which was distinguished for its brave and obstinate resistance. In 1698, after the complete subjugation of the country, another outbreak occurred, which was soon put down. This was the last resistance exhibited by the natives to the dominion of the Spaniards.

New Mexico is bounded to the north and east by the territory of the United States, on the south by Texas and the department of Chihuahua, and on the west by Upper California. It is surrounded by chains of mountains and prairie wilds, and in the direction of Chihuahua is separated from the Mexican settlements of that department by an unpeopled desert of nearly 200 miles. There is not a single navigable stream in New Mexico. The Rio del Norte is so shallow for the greater part of the year that Indian canoes can scarcely float on it, and the navigation is interrupted by shoals for more than 1000 miles below Santa Fé. Opposite to Taos it runs for 15 miles pent up in a deep *cañon*, through which it passes in a rapid torrent.

Santa Fé [de San Francisco] occupies the site of an Indian village, and is situated 12 or 15 miles E. of the Rio del Norte, on a small stream, which joins the river about 20 miles to the S.W. The population little exceeds 3000; but with that of the neighbouring villages, amounts to 6000. Various observations place the town in $35^{\circ} 41'$ N. lat., or a degree S. of where it is placed in nearly all maps; and the longitude is about 106° W. of Greenwich. The highest peak of the mountain, 10 miles N.E. of the town, is calculated to be 5000 feet above the plain below, and is always covered with snow.

The settlements in the valley of Taos—for there is no distinct village of that name—include several villages, the chief of which are Fernandez and Los Ranchos. The name is taken from the Taosa tribe of Indians. No part of New Mexico equals this valley in the excellence of the soil, its produce, or appearance.

The climate of the country is very agreeable. The rainy season is from July to October.

The whole population of New Mexico is estimated as follows:—Spanish, 70,000; white Creoles, 1,000; Mestizoes, or mixed Creoles, 59,000; and Pueblos, 10,000.

At a place called Cerrillos, and in the mountains of Sandia, at Abiquiú, Picuris, and Embudo, washing for gold has been productive; but most of the *placers* have been of late neglected, on account of the state of the country.

On the table-land between the Rio del Norte and Pecos are some considerable salt lakes: the largest 5 or 6 miles in circumference.

There are several warm springs in the country. Gypsum abounds. On the borders of the *mesas*, or table-land, beautiful specimens of petrified trees have been found.

Mr. Gregg states that the Mora is the last of the branches of the Canadian river on the route to San Miguel. From thence to the Gallinas river the road stretches over an elevated plain unobstructed by any mountainous ridge. Twenty miles from the Gallinas is the town of San Miguel, in the fertile valley of the Pecos, and 50 miles S.E. of Santa Fé.

The great table-land of New Mexico, called by Mr. Falconer (*Journal of the Royal Geographical Society*, vol. xiii., p. 213) the Grand Prairie, Mr. Gregg says, is known among the people of New Mexico by the name of the Llano Estacado. This remarkable elevation is, he adds, bounded on the N. by the Canadian river, extends E. to near the boundary of the United States, and S. to the sources of the Trinity, Brazos, and the Colorado rivers. This southern boundary is not quite accurate, unless the two *plateaux* or steppes below it are treated as continuations of it. He mentions that the Red River rises in the Llano Estacado, and has no mountainous elevation at its source, according to the reports of traders and hunters. Mr. Falconer thought that his party missed the main stream of the river (*Journal of the Royal Geographical Society*, vol. xiii., p. 212); but according to this account the river called by the Mexicans the Rio Escaravedra was the Red River, which they must have followed to its termination on this great plain, and were therefore the first travellers known to have reached it.

For other particulars relating to this country the work of Mr. Gregg may be referred to. It gives a very lively and, without doubt, a very faithful account of his travels in these regions. Of a large part of the country visited by him, and of the Indian tribes in it, there has been no previous notice. A map accompanies the work, and adds many new particulars to our knowledge of a country still very imperfectly explored. It does not profess to be an accurate map, and it may be doubted if it is correct in representing the Laguna Colorada, and the stream of Parajito,

to communicate with the Canadian river, instead of with the river Pecos.

Mr. Gregg has given many particulars of the road from Santa Fé to the city of Aguas Calientes. One very remarkable point on the road he thus describes:—

* After leaving El Paso our road branched off at an angle about two points to the westward of the Rio del Norte—the city of Chihuahua being situated nearly 100 miles to the west of it. At the distance of about 30 miles we reached Los Médanos (the Arenales), a stupendous ledge of sand-hills, across which the road passes for about six miles. As teams are never able to haul the loaded waggons over this region of loose sand, we engaged an *atajo* of mules at El Paso, upon which to convey our goods across. These Médanos consist of huge hillocks and ridges of pure sand, in many places [almost entirely] without a vestige of vegetation. Through the lowest gaps between the hills the road winds its way. What renders this portion of the route more unpleasant and fatiguing is the great scarcity of water. All that is to be found on the road, for the distance of more than 60 miles after leaving El Paso, consists of two fetid springs, or pools, whose water is only rendered tolerable by necessity.

At Lake Patos, a few miles beyond the Médanos, water is always to be found. When Mr. Falconer crossed the Arenales, the waggons accompanied the party; but the six miles occupied nearly two days.

IV.—*The History of Oregon and California, and the other Territories on the North-West Coast of North America, accompanied by a Geographical View and Map of those Countries, and a number of documents as proofs and illustrations of the History.* By Robert Greenhow, Librarian of the Department of State of the United States. Boston. 1844. Communicated by Thomas Falconer, Esq., of Lincoln's Inn.

THE political boundaries of countries are, no doubt, a material part of descriptive geography, but the subject discussed by Mr. Greenhow being at this time one of controversy between the British Government and the United States, it would compromise the scientific character of this Journal to engage in a discussion of its merits. It is sufficient to state that the boundary claimed by the United States depends chiefly on its purchase of Louisiana from France in 1803, and its treaty with Spain in 1819. This treaty of purchase, though it contains many very important expressions affecting any judgment that can be made on the question at issue, is not printed in this work. In a grant, however, respecting Louisiana, made to M. Crozat by Louis XIV., this province is stated to be bounded on the west by New Mexico, and not by

$16^{\circ} 13' 33''$, and long. $94^{\circ} 59' 41''$). It was extended along a distance of 16,930 metres.

After this was done attention was directed to the lakes east of Tehuantepec. The largest of these is almost divided by the meridian 95° W. of Greenwich, and lies between $16^{\circ} 15'$ and $16^{\circ} 25'$ lat. It is called by the natives Duic-quialoi (upper lake). The River Juchitan runs into it from the N.W. of this meridian; the Estacada a little E. of N.; the River Chicapa a little W. of N., and the Espanta Perros from about the N.W. On the south it is separated by a narrow strip of land from Lake Quialiato (lower sea), with which it communicates at the S.E. by the canal of Sta. Teresa. This lower lake lies also east of the other lake, as well as running south of it, and is separated from the sea, except at the entrance called the Boca Barra, by a long strip of land. Into this lake flows the River Xocuapa, and also in part the River Ostuta, though this last-named river runs directly into a third and more easterly lake, named Huaxlan-duic, which communicates on the west with the lower lake, but has no direct entrance of its own to the sea.

The River Tehuantepec formerly flowed into the lower lake on the west, but its course has changed, and it runs in a southerly direction to the sea. It is suggested (p. 24) that the sand-banks of the Boca Barra were formed through the opposing currents of the rivers running into these lakes. The River Tehuantepec no longer contributes to this effect. The River Juchitan, it is thought, may be turned into another channel, and the waters of the Chiapa will be directed to supply the proposed canal. "These obstacles once removed, it would neither be difficult nor expensive to render practicable the Boca Barra with the certainty that the sand-bank, which offered so great an obstacle to the projected communication, will never be formed again."

In October the exploring party divided. Captain Robles undertook to determine the position of Juchitan, to extend the trigonometrical observations to the foot of the mountains, and to explore the upper part of the River Ostuta. Don Gaetano Moro proceeded to Mal Paso, to the north, across the mountains, through Chivela Guichicovi and Boca del Monte, to the west of the southern branches of the Coatzacoalcos. The gentle hills in the neighbourhood of Chivela approaching Guichicovi are interrupted by precipitous ravines through which the streams pass. The ground becomes more level receding from Guichicovi to Boca del Monte, whence to Mal Paso it is a perfect plain, occupied by a forest of timber-trees. At Mal Paso the Coatzacoalcos has the appearance of an artificial canal, from the transparency of its waters and slowness of the current. Its banks are of a firm clay, easy of access, with a uniform elevation of a few metres. It appears to run along

a nearly level surface, though woods on the banks concealed the aspect of the land covered by them.

The party came back to Chivela, and proceeded over the Mesa de Tarifa to Tarifa, then S.E. to the Portillo de Tarifa, from which a rapid descent leads to the plain in which is situated the Venta de Chicapa, on the River Chicapa. They here found that the survey of the Ostuta had been abandoned, under the impression that its direction was too much to the east. Going north, and to the east of Tarifa, from a hill above San Miguel, which they named the Cerro de Albricias (Reward Hill), they obtained a view of the country which determined their future operations.

The district of which the Mesa de Tarifa forms nearly the centre, interrupts the chain of the Andes called the Sierra Madre, which descends rapidly on the west as far as the village of Santa Maria Petapa, and again suddenly commences towards the east of San Miguel Chimalapa, the centre being comparatively level. To the south the small chain of Masahua and Espinosa, of moderate elevation, forms a barrier between the Mesa de Tarifa and the true plain to the south: the road from Chivela to the plain going through a gap on the western extremity, and the road from Tarifa to the Venta de Chicapa passing through a gap on the east. The table-land extends to the north, gently descending to the Coatzacoalcos, and from thence to the Atlantic. The River Chicapa, which falls into the upper lake, Duic-quialoi, runs from San Miguel Chimalapa, where its general direction is north and south, to the lake. But at this place it has a direction east and west, between two uninterrupted chains of mountains. The stream of the Moneiza, a branch of the Chiapa, continues this east and west line to the west of San Miguel, but is separated from the Mesa de Tarifa by a chain, of which the Cerro del Convento is a part.

The village of San Miguel is situated in a small valley, lower than the plain of Tarifa by more than 80 metres; but as the most northern of the two chains of mountains between which the rivers Chicapa and Monetza run has no interruption, it was thought possible to lead the waters of Chicapa along its side to Tarifa. To ascertain if this were practicable, Lieut. Guido was sent to Tarifa with a barometer, while another was taken to Ultimo Rancho.

From San Miguel to Ultimo Rancho five constant streams run into the Chicapa, and from these, and also from the Monetza and the Chicapa, a body of water of seven cubic metres (per second?) is to be calculated on for the supply of the proposed canal.

Going back west, the Cerro del Convento was examined. Where the hill of Convento is most depressed, on the northern side, the River Monetza takes its source, and, crossing it, comes out into a valley, and runs to San Miguel. The point of the

opening, where the river has its origin, is hollow, and the water issues from the walls of a cave 7 metres high. The rock is of pure marble. As the river runs under [at the base of?] the Cerro del Convento, it crosses a distance of only 100 metres, though it passes the centre and the thickest part of it. The source of this river is nearly on the same level as a stream near Tarifa—the Rio de Tarifa—which runs into the Coatzacoalcos. The ground between the two is nearly level, and is interrupted by torrent streams, which run into the Monetza. This was, therefore, considered to be the proper point for the division of [communication between?] the waters of the proposed canal.

The houses of Tarifa are in the midst of a ground which is inundated in the rainy season, and the plain has consequently been called the Lake of Tarifa. It was inferred from the line marked by the water, near the Portillo, or opening of the road to Venta, south of Tarifa, that a cut made near the Portillo would drain part of these waters to the Pacific, and the rest would flow to the Atlantic.

Attention was now directed to "the mighty river Ostuta," and Don Gaetano proceeded to Zanatepec, and thence to Niltpec, to explore the neighbourhood of the Cerro Atravesado. This *cerro*, or hill, is isolated on nearly every side. To the west is a deep ravine, through which the Chicapa runs: to the east the Ostuta. The difference of level was such as to leave no doubt of the facility with which their junction could be effected, and the exploration on this side was considered to be complete (pp. 36, 37).

It is to be regretted, however, that there was no survey made of the course of the Ostuta, from the *sierra* north of the Atravesado to its mouth. That the Ostuta, running from the mountains north of the Cerro Atravesado, comes from a higher level than the headwaters of the Chicapa, which rise at the base of this *cerro*, appears clear; but more information than is given is desirable respecting the navigation of the Ostuta, both down as well as up the stream; and also of the works that may be required to carry any portion of the waters of the Ostuta to the Chicapa, or thence along the side of the *sierra* north of the Chicapa and Monetza, and after uniting them with the Rio de Tarifa, along its channel to the Coatzacoalcos, of which the Rio de Tarifa is a tributary.

The country between Tarifa and the confluence of the rivers Malatengo and Del Corte is described as most fertile and pleasant. The plains near the rivers, cultivated by the inhabitants of Barrio, Petapa, and Guichicovi, are very productive. The brushwood is burnt down, the seed sown, and the ground scarcely revisited until the harvest. The line for a canal is thus described:—"A great part of the ground is covered by a succession of hillocks, so vast and complicated that it might afford numerous solutions of this

problem, and it would be impossible to select the most advantageous site [line?] without first bestowing upon the subject a long and careful study. The waters from Tarifa descend naturally to the Coatzacoalcos through grounds by no means too rugged, whilst the very existence of a labyrinth of hillocks, almost all individually isolated, or else joined together by ridges of an insignificant thickness, is sufficient to prove the practicability of the work."

The great River Coatzacoalcos was surveyed by Captain Don Manuel Robles. It takes its rise in the unexplored part of the Sierra Madre. The highest point visited was at its confluence with the Chimalapilla, S.S.E. of Santa Maria Chimalapa (lat. $16^{\circ} 53' 5''$), and its course was followed in its northerly direction to the Gulf of Mexico. At this confluence it is 119 metres above the sea. Between Mal Paso and Sitio de Abasolo-titlan are several rapids. After the junction of the River Sarabia the hills become inconsiderable, and almost entirely disappear a little below the River Jumuapa (or de la Puerta): the rapids also are less frequent, and the last of them, called the Suchil, is a little above the mouth of the River Jaltepec (or de los Miges). The general course of the river from the Malatengo to the Jumuapa is from S. to N.; then it runs N.W. to the Jaltepec, and thence to the bar its course is N.E. From Malatengo to the Sarabia its length is 35 kilometres; from Sarabia to the Jumuapa 27; from Jumuapa to the Chalchijapa 36; and to the Horqueta 65 more (one kilometre equals 1,000 metres).

After the confluence of the Jaltepec the current is scarcely apparent, and during the dry season shoals are to be met with covered by only half a metre depth of water.

At La Horqueta the river branches: the streams again uniting, having formed the island of Tacamichapa. The western branch is called Mistan; that to the east Apotzongo. The width of the first is between 90 and 100 metres, and its depth about 4 metres. On the second, 29 metres from Horqueta, is the village of San Miguel de los Almagres (or Hidalgo-titlan), the first inhabited place met with descending the river. Below this place the water is constantly 6 to 7 metres deep; but a little above it is impeded by a considerable shoal.

Below the island is the rivulet Isbuatepec, and the River Coachapa, on the right bank, and 7 kilometres below this last river that of Uspanapan, which is the most considerable of the tributary rivers. At $16\frac{1}{2}$ kilometres below Uspanapan, and $8\frac{1}{2}$ from the bar, on the left, is the River Tierra Nueva, or the Calzadas, by which the Coatzacoalcos unites with the River Huasuntan, which runs into the sea at the Barilla.

The depth of the Coatzacoalcos, from the northern point of the island of Tacamichapa to the Coachapa, is 8 metres, and from

hence to the bar, from 10 to 12 metres. Its breadth, where narrowest, 120 to 150 metres, and near the north of the Tierra Nueva nearly 700 metres. To the island, therefore, a distance of 55 kilometres, or at least to the Coachapa, the river is navigable at all seasons, for every class of ships.

The shallowest water found on the bar was 6·2 metres.

The astronomical observations appear to have been taken with care. The latitude given of Juchitan is the result of 70 observations; that of San Dionisio del Mar, of 58.

This work is a valuable addition to the geography of Mexico, and describes a country hitherto unknown. Some well-executed maps accompany it.

The following are the chief results of the astronomical observations, and of the measurements made:—

TABLE, No. 1.

Latitudes determined from astronomical observations.

Cupola of the church of Juchitan	16° 26' 10"
Church of San Mateo Huazontlan del Mar	16 12 47
Id. San Dionisio Tepehuazontlan	16 16 30
Id. San Juan Guichicovi	16 58 35
Id. Santa Maria Chimalapa	16 55 5
Paso de la Puerta	17 12 35
The strand on the right bank of the Coatzacoalcas below the mouth of the River de la Puerta (or Jumuapa)	17 21 5
South point of the island of Pedernal	17 27 45
Horqueta of the island of Tacamichapa	17 43 "
Hidalgo-titlan	17 46 36
Mina-titlan	17 58 55

TABLE, No. 2.

Geographical positions of the principal points of the Triangulation.

The longitudes are reckoned from the meridian of Juchitan, which is 95° 9' 37"·5 west of Greenwich.

	North Latitude.	West Longitude.
Cerro del Morro	16° 10' 24"	7' 57"
Xunirahui	16 12 40	13 10
Daniguibixo	16 14 36	7 16,5
Town of Huilotepec	16 14 54	7 42
Danilica (Cerro de la Cueva)	16 20 7	13 16
Daniguibedchi (Cerro del Tigre)	16 20 10	11 55
Parish church of Tehuantepec	16 20 16	12 24
Danigú or Camotepec	16 22 6	3 44

	North Latitude.			West Longitude.	
Church of Espinal	16°	29'	26''	1'	18''
Id. of Itzaltepec	16	30	27	1	57
Daniguiati	16	31	59,5	3	50
Cerro de Laollaga	16	32	32	12	51,5
Church of San Gerónimo	16	34	20	4	29
Id. de Chihuitan	16	35	44,5	8	16
Guévichi	16	37	26	5	30
East summit of Huacamaya	16	42	28	1	15,5
Guévixia	16	43	8	5	15
Pico del Almoloya	16	44	8	3	48
Church of Barrio	16	48	40	5	18
Id. Petapa	16	49	36	5	48
Id. Santo Domingo	16	49	45	7	5
				East Longitudes.	
Church of San Mateo Huazontlan del Mar	16	12	52,5	2	31
Huachilaif	16	13	32	23	49
Church of Santa Maria del Mar	16	13	33	9	56,5
Summit of Baxmumbah	16	14	42	22	27
Id. Malumbiamlaif	16	14	59	24	31
Island of Tilema	16	15	30	7	33
Summit of Umalalang	16	16	39	11	13,5
Id. of Mitiahuaxtoco (Cerro de Santa Teresa)	16	17	10	13	22
Island of Monapostiac	16	20	34	7	13
Mitiacix or Cerro de la Iguana (island)	16	23	9	9	28
Tiactinayix	16	26	12	13	40
Cerro del Zopilote	16	26	31	31	36
Hacienda (estate) of the Venta de Chicapa	16	34	„	12	14
Cerro del Lagartero	16	34	15,5	6	25
Summit of the Pie de Banco	16	34	41	20	29,5
Pico de Rinconchapa	16	37	13	11	14
Cerro de Paloblanco	16	38	17,5	13	51
Id. of Zapata	16	39	5	15	3
Summit of Piedra Parada	16	39	8	9	34
East peak of Cerro Prieto	16	39	41	2	3
The bare hill to S.S.E. of San Miguel					
Chimalapa	16	42	11	16	14
Summit of Paso Partida	16	42	17	11	28
Church of San Miguel Chimalapa	16	43	„	16	33
Cerro del Convento	16	43	11	12	15
Peak of the Cerro Atravesado	16	43	12	30	8
Hacienda of Tarifa	16	43	31	8	57
Cerro de Albricias	16	44	21	15	49
Summit of Chichihua	16	44	34	12	57

TABLE, No. 3.

Altitudes resulting from trigonometrical measurements.

	Heights above the level of the sea.
Summit of Daniguiati	metres 274,5
Top of the cupola of the church of Juchitan	35,8
Basement of the same church	18
Monapostiac	111
Umalalang	218
Daniguibixo	298
Guiévichi	416
East peak of Cerro Prieto	460
Guiévixia	598
Masahua (the middle summit)	687
East summit of Huacamaya	775
Cerro de Laollaga	1243
Palo Blanco	371
Estate of Tarifa (the place of the habitations)	208,5
Cerro de Piedra Parada	416
Id. del Convento	446
Paso Partida	466
Masahuita	615
East summit of Masahua	696
Guiéxila	1152
Peak of the Cerro Atravesado	1529
The highest peak beyond it	2343

TABLE, No. 4.

Barometrical altitudes across the Isthmus of Tehuantepec.

	Heights above the level of the sea.
Umalalang	metres 220
Mitiachuaxtoco	250
Daniguibixo	296
Venta de Chicapa (house at the estate)	24
The river Chicapa, near the Rancho of la Puerta Vieja.	83
The river Coatzacoalcas at the confluence of the Chima- lapilla	119
Source of the stream Monetza	196
Petapa (the town-house)	204
The river Chicapa at the Ultimo Rancho	208
Farm of Chivela	210
Source of the river Almoloya	225
Santo Domingo (the town-house)	226
El Barrio (idem)	232

Road from Santa Maria to San Miguel Chimalapa.

	Heights above the level of the sea.
San Miguel Chimalapa (the town-house)	metres 119
Rancho de la Cofradia	376
The stream running towards Chichihua and often traversed	275
Jacal del Ocotal	331
Pass of the river of Chichihua	189
Pass of the river Escolapa	150
Jacal del Chocolate	326
Pass of the rivers del Milagro	84
Santa Maria Chimalapa (the town-house)	262
La Piedra del Viejo (the highest point between Santa Maria and the river)	296
The river del Corte at the confluence with the Chimalapilla	119
Tehuantepec	42
Zanatepec	50
San Gabriel Boca de Monte	50
San Juan Guichicovi (the town-house)	249

TABLE, No. 5.

Heights above the level of the sea, of various places on the road from Tehuantepec to Puebla.

Tequisistlan	metres 210
Rancho de las Vacas	745
San Bartolo Yautepec	870
Rancho Quemado	1160
San Pedro Totolapan (the lowest part of the town)	940
City of Oajaca	1535
San Juan del Estado	1680
Venta de Aragon	1005
Cuicatlan	420
City of Tehuacan	1575
Tlacotepec	1905
Tepeaca	2210

MISCELLANEOUS.

- I.—*Museum for American Antiquities, instituted in Copenhagen by the Royal Society of Northern Antiquaries, according to a plan proposed by its Secretary, CHARLES C. RAFFN.* Communicated by Prof. Raffn, Cor. Mem. R.G.S. of London, &c.

[The subject of the present article, though not, strictly speaking, Geographical, belongs to a science closely allied to Geography, and by most persons considered as forming an essential branch of it. Ethnology. It is certain that a mere knowledge of the earth, independent of its inhabitants, would be of comparatively small interest; and therefore the present paper, tending as it does to throw light on the ancient dispersion of the same race over distant parts of the globe, may well find a place among the miscellaneous matter of our Journal.—ED.]

THE object of the Royal Society of Northern Antiquaries, viz., the exploring, examining, and bringing to notice everything which throws light on the olden time of the North, naturally led it to devote special attention to Greenland, where we have historical evidence of an early colony of Northmen, who have since entirely disappeared, and have been replaced by Esquimaux; and whose traces therefore can only be discovered by excavations, and researches in places, some of which are no longer inhabited. For the furtherance of this object the Society thought it right to employ some of the means which were placed at its disposal; and the result of the journeys and excavations performed in consequence, has been the acquisition of a tolerably rich store of materials, which, serving to throw light on the Northmen's colonization of Greenland, are well worthy of being admitted into a collection of Northern antiquities. It required, however, a close examination and comparison before it was possible to pronounce with any degree of certainty as to which of the articles were of Scandinavian origin, and which of them belonged to the earlier Esquimaux, who, before the European came a second time to Greenland, must have been obliged to make use of very imperfect implements and materials. It was also very interesting and instructive to observe how the Europeans, under the impulse of climate and locality, had been compelled to employ either different implements from those which they had used at home, or the same implements, but in a different manner. Nothing could

better serve as a clue in these investigations than the Esquimaux articles found in the same districts, for although they have long ceased to be employed in the country, they are well adapted to receive illustration from the objects which have replaced them; seeing that these latter, though made of a different material, have in most cases been allowed to retain the same form. Consequently the Society took every pains to procure and collect as many as possible of the Esquimaux antiquities, which, along with the Scandinavian ones above mentioned, now form a *Collection of Greenland Antiquities*.

As we have historical evidence that a colony of Northmen went from Greenland to the eastern coast of North America in the tenth and eleventh centuries, the Society, being desirous of discovering traces of this colony, entered into correspondence with several learned men in North America. From them it obtained accounts of a building and other monuments, and more especially of antiquities found at various places, part of which furnish clear evidence of the Northmen's residence in North America, while others awaken a lively interest by their great similarity to Scandinavian antiquities. By means of the obliging assistance of its American members and friends, the Society thus obtained many very valuable specimens of antiquities, the greater part consisting of stones or urns, which, though by no means of Scandinavian origin, do yet bear a striking resemblance to them—a resemblance which must doubtless be traced chiefly to the circumstance, that human beings placed in the same degree of civilization and, as in the case of North America, under similar influences in regard to climate, have had recourse to the same instruments, and have fabricated them in a similar fashion. The articles thus received from America were found to be so illustrative, that the Society resolved to avail itself henceforward of its connexions with that part of the world, in order to bring together as complete a collection as possible of all kinds of American antiquities, which must prove so much the more interesting as the number of such collections at present to be found in Europe is very limited.

As the Society had already collected a large quantity of objects, a plan was submitted to his Majesty the King of Denmark, who was most graciously pleased to approve of it, and to sanction the institution of a special museum, for the use of which a room has been set apart in the palace of Christiansburg, immediately adjoining that occupied by the Museum of Northern Antiquities, but from which the American Museum will at all times be kept perfectly distinct.

The contents of this museum, which is intended to contain all such antiquities, from any part of America, as the Society may receive, will soon be classed as follows:—*European Antiquities*

from America; *Esquimaux Antiquities*; *Indian Articles*, from North America; *Mexican Antiquities*; *Carib Articles* from the Antilles; and *Indian Articles* from South America.

I will now mention the most important of the articles previously possessed by the Society, and the large additions which it has received during the last year.

EUROPEAN ANTIQUITIES FROM AMERICA, from the *Ante-Columbian times of that hemisphere*.—Of antiquarian remains from the Icelanders and Northmen in Greenland, the museum already possesses a considerable quantity, which will serve as a foundation for this division. The remarkable Runic stone from Kingiktórsoak (an island situated in Baffin's Bay, in N. lat. $72^{\circ} 55'$), together with two other inscription-stones from Igaliko and Ikigeit (of which delineations are contained in *Rafn's Antiquitates Americane*, tab. viii.; see also pp. 340-355 of the same work), and the fragments, found in Greenland, of stones with Icelandic inscriptions, in Runes or Latin characters, serve as indubitable proofs of the origin of the articles found along with them. As the most important of such antiquities we may here mention the collection of articles found in the churchyard of Ikigeit, which place had previously remained undiscovered and undisturbed, but which on that occasion was carefully examined under the guidance and inspection of M. Kielsen. More detailed accounts of this interesting examination and its results are to be found in the Society's *Annals of Northern Archaeology*, 1842-1843. Not only inscription-stones in the old Danish tongue, and with the Christian Cross, but also several dresses (one of them almost entire) made of a coarse four-threaded woollen stuff, precisely like those that have been found in old Scandinavian graves, were discovered, as likewise fragments of coffins made of drift-wood, vessels of pot-stone and metal, and several iron implements. Along with the above articles may be classed the entirely similar ones which the Rev. George F. Tørgensen discovered in the churchyards at Igaliko, Kaksiårsoak, and Kakortok. (See *Annals of N. Archæol.*, 1838-1839, and 1842-1843.) The articles obtained from these churchyards, which demonstrably owe their origin to Northmen—whose bodies moreover, by their size and their hair, are easily distinguished from those of the Esquimaux—are in considerable quantity, and will enable us to assign other articles of the same sort, received without historical elucidations, to their proper class.

By means of a gradually-acquired experience we can now, with tolerable certainty, distinguish the ESQUIMAUX from the SCANDINAVIAN ANTIQUITIES. The most remarkable of them consist principally in implements of bone or stone, which the Esquimaux in default of metal had been obliged to use. As

they are of a much later date, so they are also found in much greater quantity than the Scandinavian antiquities; and in almost all the antiquarian reports contained in the volumes of the Society's Annals, mention is made of Esquimaux antiquities having been sent to the Society, viz. harpoon-points, arrow-heads of chalcedony or angmak (?), javelins and dart-points of stone and bone; vessels and lamps of pot-stone, &c. As one of the most valuable collections received in 1843, we may here particularly mention that sent by Mr. Möller of Holsteinburg. It contained, among other articles, harpoons entirely made of bone, and which were of so large a size that we must suppose they were used against whales, and not merely against seals; also a small piece of Scandinavian bell-metal from the Ante-Columbian times, which the Esquimaux had attempted to form into an arrow-head; a knife entirely made of bone and polished, and several implements of bone different from those now in use.

OF INDIAN ANTIQUITIES FROM NORTH AMERICA, the Society has from time to time received considerable collections from Mr. Woodside, Dr. Webb, Dr. Jerome V. C. Smith, Dr. Swift, Jacob G. Morris, Esq., Dr. Jacob Porter, Charles Hammond, Esq., and others, of all of which, detailed accounts are given in the Society's Annual Reports from 1838 to 1842. Almost all the articles received are such as have been dug up in Massachusetts, Pennsylvania, or Ohio, and consist chiefly of stone implements, which bear a remarkable resemblance to our Scandinavian antiquities of the stone age. In the Annual Report for 1842 mention is made of a collection of 200 articles, received from Dr. Swift, of Easton, in Pennsylvania; and in the year 1843 there were received from the same gentleman 250 articles, not including duplicates, all found within the compass of a space, not exceeding 2 acres in extent, on the banks of the Delaware, 5 miles below Easton. Dr. Swift was of opinion that the spot in question had been inhabited by a fixed tribe, which had occupied itself in the fabrication of stone implements, for the purpose of bartering them with other Indians who had not so easy an access to the materials, or perhaps had not acquired the same dexterity in their fabrication; a supposition rendered the more probable from the very great quantity of jasper and flint found in that locality. A very valuable collection of North American antiquities has likewise been transmitted by Charles Hammond, Esq., of Boston: the greater part is of stone, but some few are of bone and bronze; there were also several curious urns of burnt clay, some of them found at Dresden in Maine, others in Indian burying-places near Nahant, Middleburg and Rochester, Massachusetts, and some at Middletown in Connecticut. Some of these bear a great resemblance to our Northern articles from the stone age;

and here we must consider it as a very fortunate circumstance that Mr. Hammond has kept the articles found at different places carefully distinct from each other, and has accurately noted the localities where they severally were found. In this collection, which contains 300 articles, the most remarkable in point of shape and workmanship are the urns, some of which are of black clay, and others of red; and one of them in particular is ornamented both in the interior and on the edges with engraved figures. The collection also contains several axes and wedges, several deeply-hollowed gouges of different sorts of stone, and a considerable number of arrow-heads of flint, petrosilex, and white quartz, of various shapes, resembling occasionally our Scandinavian ones. Some more bulky articles were also included, such as a large stone vessel of nearly 3 feet in diameter, found in 1799 near Assawamsit, and which had probably been employed for grinding corn; and two stone mortars or corn-crushers of serpentine and granite, which, together with the pestles belonging to them, were dug up at Mattapoisett in Massachusetts. Several stone articles were likewise received from Dr. Jacob Porter and Dr. Jerome V. C. Smith; which, with the remarkable bronze antiquities and articles of dress, found on human skeletons at Fall River in Massachusetts, and similar specimens received in the preceding years, are mentioned in the Annual Reports for 1838 and 1842, and form the subject of a disquisition by Thomas H. Webb and Charles C. Rafn, inserted in the Society's *Mémoires* for 1840-1844, p. 104-119, tab. v. In addition to these articles the Society has received from Dr. Smith a fragment of a bronze plate found on the breast of a skeleton, several bronze tubes belonging to a belt, an arrow-head of bronze with the shaft belonging to it of wood, some fragments of leather, and of cloth woven of bulrushes.

Of MEXICAN ANTIQUITIES, the Society received in 1843, from Professor Hegewish, some flakes (splinters) of obsidian quite like the Northern flint flakes, and a piece of obsidian from which these had been struck off, precisely similar to those found in the North. Next to these will be placed antiquities from California (see Annual Report for 1841, p. 6); and next to those of the Esquimaux will be arranged articles from Russian America, particularly from the Aleutian Isles, which in their turn will receive elucidation from a comparison with sundry Asiatic antiquities—such as those from Siberia, from the Kurile Islands, and from Japan, which are to be found mentioned in the Annual Report for 1838.

Of CARIB ARTICLES, the museum possesses only a small number, but it is to be hoped that the Society's connexion with the Antilles will lead to their increase. His Majesty the King of Denmark some time ago presented the Society with a battle-

axe or mace $9\frac{1}{2}$ inches long, fabricated in a most masterly manner of greenstone, in a form not hitherto met with, that reminds us of the ass's jaw-bone of Samson. This beautiful specimen was dug up at Porto Rico, and presented to his Majesty by Governor Scholten. In a lagoon in the vicinity of Frederick's Fort, at St. Croix, was found a remarkable wedge of green stone porphyry, nearly 14 inches in length, which the commandant of that fort, Capt. Julius Castonier, has lately presented to the Society. The Society had previously received from Capt. T. A. Kiar eight different wedges of the same sort of stone, perfectly similar to the Northern ones, and which had been found in the Virgin Isles.

INDIAN ANTIQUITIES FROM SOUTH AMERICA have been on several occasions sent to the Society from the Brazils by Dr. Lund (see his Essay in the Society's *Annals* for 1838-1839, p. 159, ff., and Annual Report for 1841). Mr. Virgil von Helmreichen, naturalist from Austria, who is at present travelling in the Brazils, has sent to the Society two lance-shaped stone arrow-heads, which in 1841 were found in Cidade Diamantina, formerly called Tejuco, in the province of Minas Geraes. They were both obtained in the process of washing the diamond-yielding *cascalho*, a soil composed of sand and small stones, and on both occasions were found in the *batia* or washing-tub. It was not possible for Mr. Helmreichen to ascertain with any degree of certainty whether they had been imbedded in the *cascalho* stratum itself, or in the alluvial formation which encrusted it. One of these arrow-heads, which is of petrosilex, came from the Corrego de Provonçao, and the other, which is of rock-crystal, from the Riberão do Pinheiro, about 200 fathoms from the place where the former stream, in its progress from the S., falls into the latter. Respecting the age of these arrow-heads, Mr. Helmreichen dares not venture to offer any opinion; this much, however, is certain, that the Indians now inhabiting the province of Minas Geraes fabricate their arrow-heads of wood and jacoara, and do not make use of stone for that purpose. From Chili, Dr. Kröyer brought a silver pincer; and from Peru, the Rev. Dines Pontoppidan brought five antique vases—all of them mentioned in the Annual Report for 1841; and in a separate essay, illustrated with engravings, in the Society's *Mémoires*, 1840-1844, where, at p. 161, a representation is given of the Chilesian pincer in juxtaposition with one of bronze found in Denmark. Capt. Suensen, R.N., has presented to the Society a small globular body of bronze, which on the one side is ornamented with a face, above which are one small and two larger rings. It is half an inch (?) in diameter, and was found in the district of Lima. Mr. Pontoppidan brought also from California a bow and six arrows with points of black or green obsidian and some of rock-crystal.

After having given this general view of the American antiquities already in the possession of the Museum, we have only further to add that Mr. Uhde, in Mexico, has offered to present to the Society a collection of Mexican antiquities; and that, according to a letter from Mr. Witt, the Danish Consul in Peru, an arrangement has been entered into with the Director of the National Museum in Lima, agreeably to which he has consented to cede to the Museum a collection of Peruvian antiquities on receiving an equivalent in minerals of northern Europe, and other articles of scientific interest from this quarter.

II.—*Geographical and Statistical Notices, particularly on the Rhône and Geneva.* Being extracts from a letter from Professor CHAIX, Cor. Mem. R.G.S., &c., at Geneva.

AMONG late geographical works I must specially mention Mr. Forbes's 'Travels through the Alps of Savoy,' &c.: it is by far the best thing that has for a long time been written on our Alps either by natives or foreigners. Mr. Forbes has proved himself a worthy successor of De Saussure by his modesty, his keenness of observation, his absence of charlatanry, and laborious researches. He clearly shows the defects of the explanations of Agassiz, Venets, &c., of the progress of glaciers, though there may also be some slight objections to his own. It is now much the fashion to visit the little pole on the glacier of the Aar, and a great noise is made about it. But it appears to me that after much good and sound work, M. Agassiz, though a man of great ability, will not found a lasting theory; his satellites will vanish, and we shall come back to an explanation not very different from that of Mr. Forbes, of M. de Saussure, and of M. Rendu, the present Bishop of Annecy. Mr. Forbes is a very bold and indefatigable explorer, and not many will dare to follow him everywhere he has been.

A short paper by M. Guinand, Professor of Geography at Lausanne, under the title of 'Vallée de la Viège,' has also been published on a part of the ground gone over by Professor Forbes; but this essay is merely confined to a few remarks on the history, picturesque nature, and general geography of that valley, which extends from the foot of Mount Cervin and Mount Rose to the banks of the Rhône at Viège (Visp.); it is not in any way to be compared with Professor Forbes's excellent book.

I do not give you any account of the progress of observations made on the glaciers by M. Agassiz and his friends, as I presume you are directly supplied by your corresponding member at Neuchâtel with every information on this subject. A meteorological

logical observatory has lately been established at Aoste by Canon George Carrel, who is as yet the only observer. The observatory is a turret situated under $45^{\circ} 44' 10''.4$ N. lat., and $4^{\circ} 59' 48''.9$ long. E. of Paris. It is 613 metres above the level of the sea, if deduced from a comparison with the Great St. Bernard, and 615.2m. from comparison with Geneva. An account of the observations made during the year 1842 has been inserted in the 'Bibl. Universelle.' The range of the barometer was greater than at Geneva and the Great St. Bernard. It is the same with the thermometer. The average annual temperature has been found a little above 11° centigrade; but that deduced from the temperature of wells and springs in the neighbourhood of Aoste is from $9\frac{1}{2}^{\circ}$ to 10° . The quantity of rain and snow-water has been 784 millimetres in 1841, and 457 in 1842 (much less than in Lombardy), while at Geneva the same years brought 1257 and 844 millimetres. The most rainy months at Aoste are April and September.

* * * * *

The physical geography of the Rhône and of our lake has been of late the subject of much inquiry and discussion, both scientific and political. An essay has been published, in 1843, at Lyon, by Dr. Lortet, under the title of 'Documents pour servir à la Géographie Physique du Bassin du Rhône,' accompanied—1st, by a very rough sketch map of that country, crowded with 1400 indications of the heights of places; 2ndly, by sections of the descent of the river in all parts of its course and of the mountain-ranges which bound its basin; 3rdly, by a table of the quantity of rain observed at Lyon during 20 months only. The Rhône still bears in Upper Valais the names of Rhodan, Radden, and Ratten; its fall is 18 metres for each kilometre (or 1 in $55\frac{1}{2}$), from the lower end of its glacier at the mouth of the Saltine (a tributary stream coming from the Simplon) to Brigg. From Brigg to Martigny, and thence to the lake of Geneva, the average fall is 2 metres to a kilometre (1 in 500). In these three stages the length of the river is 61 kilometres, 104, and 37. Its breadth increases from 23 to 126 metres at the mouth of the Saltine, and 153 metres at its entrance into the lake; but it is reduced to 30 metres under the bridge at Saint Maurice.

The breadth is 91 metres where it receives the Arve; 10 metres only at the mouth of the Valserine; 59 metres at the mouth of the Torrent des Usses. Thence to the mouth of the river Aine, 237 to 311 metres, though it is narrowed to 40 metres at Saint Alban, between l'Huis (*huis* an old word meaning a door; hence *huissier*) and Meirieux. Lower down, meeting with numerous islets in the neighbourhood of Miribel, it widens again to 3000 and even

4000 metres. It is 209 metres broad at the Pont-Morand in Lyon, 616 metres at the Pont Saint Esprit, 662 metres at Avignon (225 metres for the first arm, 437 for the second), and 450 at Beaucaire.

The perimeter of the basin of the Rhône is 2198 kilometres (1347 miles), and its extent 9,775,000 hectares (37,741 square miles); of which 4,279,943 belong to its right bank, and 5,494,992 to its left. This greater extent of the left part of the basin is also observable in some of its tributary streams, as the Durance, Isère, and Saône. The extent of the basin above the lake of Geneva is 524,546 hectares; that of the lake and tributary streams, 243,755; of the Saône, 2,982,943 hectares; of the river Isère, 1,179,800; and of the Durance, 1,343,000.

The Saône and the Upper Rhône itself have much less fall than its other tributaries: the total fall of the Durance is 2187 metres; of the Isère, 2320; of the Arve, 1928 metres; of the Dranse d'Entremont, 1911 metres: making an average fall of 7, 8, 20, and 61 metres for each kilometre.

Before we follow the stream down to its mouth, says Dr. L., let us stop on the banks of the Saône, the most conspicuous among the tributaries of the Rhône. On the table-land where its spring rises there are no alpine features to be seen, no icy jagged peaks standing out against a blue sky; the horizon is marked all around by a low line. At the head of the dell of Vioménil are four reservoirs hollowed out of the sandstone, the bottom of which is clad with green potamogeton. These are the sources of the river Saône, the waters of which flow through green meadows, and soon set a mill in motion. They run as far as Darney, through a pleasant vale shaded with willows, beech, and oak, and flow so smoothly that they do not even displace a few stones that enable you to step across its bed; the river has the appearance of a canal sending its waters over extensive meadows through a number of trenches and rills that absorb them in such quantity as to stop for a long time the rise of the stream in the bed itself, and rendering very slow the progress of a general overflowing of the country. The fall of the Saône is one-third that of the Rhône; the nature of this river combines very advantageously with that of the Rhône to make their united stream very useful; for the Rhône singly would be but a torrent.

From Lyon to Arles the Rhône flows in a stony bed, bounded by banks of sand and clay only 3 or 4 metres above low-water mark, and consequently overflowed during the high waters. In a course of 330,000 metres it has an average fall of 0.54m. for each kilometre, according to the measures taken by Commandant Depigny. At Beaucaire the Rhône has received all its tributary streams, and flows in a single bed through a flat country diversi-

fied by a few rocky hills called *Alpines*, rising, at a great distance from its banks, to the height of 480 metres. A few sailing vessels are already met with in this part. Between Trinquetaille and Fourques the *Petit Rhône* branches off to the right from the main stream, flowing S.W. with numerous curves, and falls into the sea 39 kilometres west of the mouths of the *Grand Rhône*. It even sends out a more western branch, called the *Rhône-mort*, from its having been almost dried up in the 15th century. The main stream, called *Grand Rhône*, flows under the walls of the old city of Arles, with a fall of 0.4m. per kilometre, and a depth sometimes of 16 metres, in a channel of 800 metres broad. It reaches the sea by three openings, called *Graou du Levant*, *Graou du Ponent*, and *Graou du Midi*; after having again lost a small portion of its waters through the *Canal du Japon*, a natural bed that was opened, in 1711, by a flood between the *Graous* and the mouth of the *Lesser Rhône*. A volume of 1779 cubic metres of water in a second roll in the channel of the *Grand Rhône*, and 421 cubic metres in the *Lesser Rhône*, making together 2200; but as a part of that supply is absorbed by the numerous rills and spungy lands of the delta, 2000 cubic metres alone reach the sea by the two streams.

The delta of the Rhône is an aggregation of islands called *La Camargue*, 30 kilometres from N. to S., with an extent of 55,000 hectares, or 212 square miles, and an average height of 3.77m. above the level of the waters. Its soil is a clay of various colours, very fertile, but only lately put under tillage, and with great advantage both to the owners and to the health of the inhabitants, till now much subject to fevers.

A French engineer of the *Ponts et Chaussées*, M. Vallée, has published his own observations on the bed of the Rhône from Geneva to Lyon, combined with the measures of other French and Swiss engineers, with a view to its being made navigable all the year round, through the whole distance between Geneva and the sea. He advises the construction of very gigantic works between Fort de l'Ecluse and Seyssel, and at Geneva, without in the least minding the damage to the proprietors living on the shores of our lake, or the expense of the work. To this he has also added a most ludicrous explanation of the phenomenon called *Seiches*.* Still as M. Vallée has given in his work some positive results from the observations of others, I have sifted out the following from his numerous pages:—

* For some account of this phenomenon see vol. iii., p. 271, of our Journal.—[Ed.]

	Partial Distances	Cumulated Distances.	Height above the Sea.	Average fall for one Kilometre.
	Metres.	Metres.	Metres.	Metres.
From the mouth of the river to Arles . . .	41,700	41,700	2.22	0.053
Arles to Tarascon	15,581	. . .	6.71	0.288
Tarascon to Roguemaure	45,580	. . .	24.50	0.391
Roguemaure to the mouth of the <i>Lex</i> . . .	21,420	. . .	86.17	0.545
The <i>Lex</i> to Valence	95,380	215,610	107.00	0.742
Valence to the mouth of the <i>Isère</i> . . .	6,276	. . .	111.36	0.694
The <i>Isère</i> to the Galaure	28,068	. . .	127.21	0.565
The Galaure to the mouth of the Bancel . .	7,096	. . .	130.63	0.482
The Bancel to the Dolon	8,920	. . .	134.69	0.444
The Dolon to the river Varaise	14,690	. . .	142.07	0.509
The Varaise to Vienne	16,530	. . .	149.38	0.442
Vienne to Givors	11,015	. . .	154.61	0.474
Givors to Lyon	15,170	327,375	162.86	0.543
Lyon to Thil	20,000	. . .	181.50	0.932
Thil to the mouth of the river Ain	15,500	. . .	191.50	0.645
The Ain to the Saut du Rhône	28,000	. . .	200.00	0.303
The Saut to Port Bizarre	3,500	. . .	202.50	0.714
Port Bizarre to Groslee	22,100	. . .	209.00	0.294
Groslee to Cordon	12,500	. . .	215.00	0.480
Cordon to the Parc, where navigation ceases	61,800	490,775	274.00	0.954
The Parc to Bellegarde	12,500	. . .	297.59	1.887
Bellegarde to the Perte du Rhône	2,918	. . .	308.81	3.645
The Perte to the New Mill under Chevrier .	8,595	. . .	326.54	2.063
New Mill to the boundary of Switzerland .	4,591	. . .	336.12	2.086
The Boundary to the mill of Charlux . . .	5,250	. . .	344.85	1.663
Charlux to the rivulet des Charmilles . .	3,880	. . .	350.15	1.366
The Charmilles to the coppice of Ray . . .	6,270	. . .	361.00	1.730
Ray to the Mill des Vaux	5,100	. . .	367.40	1.255
Vaux to Geneva	5,218	545,907	375.00	1.456
			Total fall.	
			Metres.	
From the lake of Geneva to the Parc . . .	. . .	54,322	101.00	1.859
The Parc to Lyon . . . . .	. . .	163,400	111.14	0.680
Lyon to the sea . . . . .	. . .	327,375	162.86	0.497
From the lake to the sea . . . . .	. . .	545,097	375.00	0.688

These figures are taken from the works of MM. O'Brien and Soirée.

Experiments have been made by MM. Dufour, De la Rive and Colladon, from Geneva, and by MM. Vallée and Goux, two French engineers, on the Rhône within our frontier: the average rapidity of the stream has been found 2.29 m. per second within our canton; in one instance even 4.11 m. The depth during low water, generally more than 1 metre, is, however, in two instances only 0.70 m.

Between Seyssel and Lyon, a rapid exists under the name of *Saut du Rhône*, where there is a fall of 1.8 m. in a channel 200 metres long; care must be taken by the steamers which run through it during the droughts, but as the waters come to their mean height the passage is no longer dangerous.

It is below Lyon that the river is most important as a navigable stream: the steamers carried, in 1838, 25,223 passengers; in 1841, 68,695 passengers, and 345,000 tons of merchandise. They are stopped when there is less than 1·2 m. of water in the channel, and that is the case for 45 days every year. During the droughts of the spring, in 1840, M. Mondot de la Gorce found the depth of water to be less than 2 metres on a united* line of 38 kilometres, between Lyon and Arles, and even 0·46 m. in a few places. Within Lyon the stream runs 2·5 m. in a second.

As to the quantity of water poured down into the sea by that large river, it differs greatly according to the season in which it is measured. Numerous measurements and sections have been made to ascertain it, which may give a correct idea of the volume of the Rhône and its tributary streams during the low waters; but we cannot receive them for more than mere estimation for the time when the rivers rise.

Within the city of Geneva M. Dufour found, on the 24th of September, 1840, the supply to be 424 cubic metres in a second. M. Vallée measured it also in September, 1840 (when the lake, however, had subsided 1 decimetre), a little above the mouth of the Arve, and found only 240 cubic metres. In the same place, MM. Vallée and Goux measured it again on the 26th of July, 1841, the lake being 0·65 m. (higher?) than in their first experiment, and found 482 cubic metres in a second. M. Goux found 649 cubic metres at high water at Chaney, the last place in our canton; 720 cubic metres at the Parc; at Seyssel, 304 cubic metres at low water, and 1230 during the high water; at the Saut du Rhône, 220 cubic metres at low water, and 1800 at high water.

M. Garella measured the Rhône at low water (2nd and 3rd of April, 1839) at Perrache, below Lyon, and found 235 before it is joined by the Saône, and 320 cubic metres after; M. Jossierand, 420 cubic metres at La Voulte, low water; M. Jossierand, 425 cubic metres at Malmouche, low water; M. Bouvier, 456 cubic metres a little above Avignon, low water.

Among the tributary streams, M. O'Brien found that the Arve furnishes 38 cubic metres per second at low water, and 354 at high water. The Saône, measured by M. Laval, gave 70 cubic metres at low water. The Gard, 2 metres only at low water. The Ouvèze, in the department of Vaucluse, after having received the Sorgue, gives 10 cubic metres through several channels during the droughts, according to M. Bouvier. M. Bouvier also found that the Durance, on the 26th of August, 1809, gave 21 metres, the water being very low at its mouth, while it rolls 80 cubic me-

* We do not know whether the author means by the term *united* a continuous line, or that the 38 kilometres is the sum of several distinct portions.—Ed.

tres at Mirabeau, of which 44 at least are drawn off for agricultural purposes. Everybody knows how difficult it is to reconcile such various measurements. M. Vallée thinks the total volume of the Rhône at its mouth is only 500 cubic metres at low water, and 14,000 during very high floods. M. Mondot de la Gorce estimated the volume of the Saône from 3600 to 4500 cubic metres in a second during the great flood of October, 1840.

The Perte du Rhône, formerly 60 metres long, no longer exists, since the Sardinian government has had the rock blown up, under which the water formerly ran. But there is still a distance of 14,160 metres between *Lear* and the *Creux du Paradis*, where navigation is stopped. Lear is a little above the Perte du Rhône, and Creux du Paradis 2000 or 3000 metres above Le Parc. Between these two places the fall of the river is very great, its banks so steep as to make landing impossible, and its bed narrowed to 18 and even 13 metres, especially at the Malpertuis (Bad Passage) 800 metres higher up than the Creux du Paradis. In the present state boats do not reach the Creux du Paradis, though it is not impossible because landing there is so; thus they stop at the Parc, 8000 metres above Seyssel.

The inundations of the Rhône have been of late so frequent as to excite much attention to the subject; memoirs have been published on their probable causes and remedies. A very good one has appeared in the 'Comptes Rendus de l'Académie des Sciences de Paris,' for the 22nd of January, 1844, from the pen of M. de Gasparin, a member of the French Chamber of Peers.

The river overflowed the country several times in the last century, especially in 1755, when dykes were raised along its banks to prevent the recurrence of such a disaster. Floods, however, occurred again in 1803, in 1810 and 1811, when the waters overthrew and flowed over the embankments; as also in 1840, 1841, 1842, and 1843. Many have been the presumed causes of these floods, such as the destruction of a great extent of forests in the high lands of the basin of the river, the embanking and narrowing of some of its tributaries, the raising of its bed by the sand and gravel it carries down; the care with which the soil has been made fast in the Cevennes, the water-rills embanked and their bottom paved. Except the raising of the bed, which is proved not to have taken place by the position of some of the oldest edifices built in the river, M. de Gasparin acknowledges all these causes as partially concurring in the result. The embanking of the tributaries, making their beds freer and narrower, sends more quickly to the main stream a mass of waters which else had been absorbed in the flats through which they formerly meandered; but few rivers have been thus embanked, especially not the Saône, whence the last floods principally originated. Paved drains have been made in parts of

the Cévennes, through which the rain-waters are poured down with much violence and great rapidity; thus the Gardon and Ardèche have caused much harm in the lower parts of the basin, but this cause exists only to a very limited extent.

The sloping sides of the mountains, when denuded by the axe, are more easily furrowed by the waters, when a large quantity of earth and stones is borne down and chokes the lower glens; sloping meadows are thus more quickly drained. The work of the axe on the high lands has been very extensive during the first 25 years of the present century; while, on the contrary, attention has been paid to the planting of new forests for the last 15 or 20 years; still 30 years elapsed without a flood, while the heights were denuded, and four consecutive floods have occurred since some care has been taken to stop the evil.

M. de Gasparin thinks general floods have been possible only when the above-mentioned causes concurred with a more powerful meteorological phenomenon which man has not the power to control, such as abundant rains brought by S. and S.E. winds, coming at a time when the soil has not been dried by long-continued heat, in the autumn or spring; and such, indeed, has been the case for the last four years.

Floods do very little harm when they occur before the harvest, and do not reach the ears of wheat; and none at all when they occur after the harvest. It has been observed, moreover, that by gradually raising the soil, they not only provide for its future protection, but make it more fertile; those lands which are not protected by embankments are now raised higher, are less time under water, and more quickly drained; they also require less manuring, no fallows, give better crops, and sell at a higher price than those protected by dykes.

You are, perhaps, not aware that the height of the water in our lake has been for many years a subject of much political discussion between the inhabitants of Geneva and the Canton de Vaud. On the left bank of the Rhône, where it flows out of the lake, there was formerly a very shallow extent of water, and no street nor any convenient landing-place on the city side. At that spot a magnificent quay, 60 feet broad, has been constructed, narrowing a part of the Rhône where it is shallowest, and increasing the rapidity of the stream. Other quays have been raised on the right bank of the Rhône without narrowing its bed, and also a few terrace walls along the shores of the lake, but not encroaching upon it.

The inhabitants of Vaud complained that these constructions kept the water higher in the basin of the lake during the winter season than was formerly the case, thus preventing them from building and repairing the numerous walls they were at that time

also raising along a great part of their shores at the foot of newly planted vineyards.

An inquiry was instituted in 1826 to consider their claims, and examine the shores of the lake. The commissioners found that the variations in the level of the low waters of the lake depended solely on meteorological phenomena. Complaints have, nevertheless, been lately renewed from the same quarter (Vevey), on the ground that the works already mentioned, including a dyke which had no influence on the level of the low waters, prevented the draining of the lake at high water, and had raised its level for the last 20 years. Daily registers have been kept at Geneva of the height of the water for a much longer period, and fortunately a *limnimètre* has been discovered, not at Geneva, but at Vevey, as also a register kept by the worthy old Colonel Mes-tre-zat from 1780 to 1825. Of this document the authors of the complaints said nothing, though they knew it well, and its accuracy is proved by its perfect correspondence with the notes preserved at the lower end of the lake. By means of those data it has been shown that,

1st. From 1775 to 1791, included, the average level of the high waters was 76·50 French inches above the 0 of the present *limnimètre* at Geneva.

2nd. From 1792 to 1801	. . . . .	76·13 inches.
3rd. From 1802 to 1811	. . . . .	78·47 „
4th. From 1812 to 1821	. . . . .	77·70 „
5th. From 1822 to 1831	. . . . .	74·30 „
6th. From 1832 to 1843	. . . . .	74·62 „

Thus proving that the high waters have not reached their former level during the last two series of years, the very period of which our neighbours complain. Colonel Dufour, to whom these questions have been repeatedly referred, concludes his report by saying that "The average level of high water on our lake is constant, being 76·25 inches above the 0 of our *limnimètre*." The middle of August is most generally the time of the high waters, but sometimes July and September. From 1806 to 1837 the time of the highest level was from the 16th of July to the 29th of September; and the lowest waters from the 18th of December to the 3rd of May, and oftener on the 7th of March. The difference in the mass of water between the lowest level ever observed and the highest is 1,615,000,000 cubic metres, according to Colonel Dufour, and 1,770,000,000, according to M. Vallée. The same difference of volume is 36,000,000 for the Lake of Bourget, and 26,000,000 in the Lake d'Annecy.

* * * * *

Our government has published very extensive tables of the

population of the canton of Geneva, compiled from the census taken on the 26th and 27th of January, 1843. In the table No. 2 is found for each parish the number of houses and inhabitants under the heads of Genevese, Swiss from other cantons, French, Sardinian subjects, and other foreigners; and of married and unmarried persons, and widows and widowers. Out of 61,871 souls which make up our whole population, 38,804 only are Genevese, 6054 from Vaud, 3123 from other cantons in Switzerland, 4419 French, 7512 from Savoy and other Sardinian states, 1492 Germans, and 467 from other nations.

The third table gives a comparison of the census taken in 1822, 1828, 1834, 1837, and 1843, showing a much slower increase of the native and Protestant population than of foreigners and Catholics—such, I believe, as may be found in every citadine population, but rather dangerous in a city surrounded by foreign states.

	CENSUS TAKEN IN					Rate of increase within 21 Years.
	1822.	1828.	1834.	1837.	1843.	
Genevese . . .	34,881	37,319	37,907	38,156	38,804	11½ per 100
Foreigners . .	16,232	16,088	18,758	20,510	23,067	42 per 100
Total number .	51,113	53,407	56,665	58,666	61,871	
Protestants . .	31,294	31,891	32,682	33,534	34,254	9½ per 100
Catholics . . .	19,760	21,437	23,800	25,023	27,504	30½ per 100
Jews	69	81	93	109	113	62 per 100

The various callings, and number of people that live by them, form the subject of tables 6 and 7. Watchmakers and jewellers have been given in a particular table, prepared with great care, in consideration of the great importance of these national branches of industry, which give employment and subsistence to 7258 persons,—men, women, and children,—4832 of whom only are Genevese. In the city alone 3872 Genevese and 1932 foreigners live by them, while, according to the census of 1788, these branches of industry supported 2487, numbering only the *men* living in the *city*.

The 5th table, the most important and most extensive as a document of general statistics, gives the age of all the classes of inhabitants for each parish and for the canton at large, and enables us to ascertain at what age the emigration of the native population begins, and the influx of foreigners settling in their place,—thus also showing the duration of life of the various nations.

I find there are 108 women to 100 male inhabitants in the canton at large, 115 and 116 in the town and its three suburbs, and 103½ in the country around. This great excess of the female

population over the male is the same as in Great Britain (see 'Bibl. Univ.,' Nov., 1842), where you number 105 women in England, 111 in Scotland, 114 in London, and even 130 in some of the Scotch towns, to 100 men.

With us the emigration diminishes the male population among the Genevèse living in the city, where men are to women only as 100 to 121, and 100 to 129 in the suburbs. The case is the same with Savoyards and Vandois living in the city and suburbs; they number 100 men to 132 women; but this is accounted for by the number of servant-maids that come from Savoy and Vaud, while male servants go more generally into the country. France and other countries furnish the city, on the contrary, with 100 males to 83 females.

The proportion of married people, widows, and widowers is to the whole population as 49 to 100 among the Genevèse, and 34½ to 100 among foreigners.

There is more vitality in the Genevèse than in the foreign population, although, or rather because, marriages take place among the Genevèse only at the average age of 26 years for the women, and 29 for the men. (See the 'Recherches Historiques et Statistiques sur la Population de Genève, son mouvement annuel et sa longévité.' By Judge Ed. Mallet. Paris, 1837. And 'Bibl. Univ.,' vol. x.) Marriages, it is true, produce 2½ children each, and Genevèse families are now far less numerous than formerly, but the mortality is also less, and almost the half of our native population reaches the age of 55.

	Men.	Women.	Women to 100 Men.
Geneva, within the walls . . .	13,569	15,620	115
" its three suburbs . . .	3,424	3,979	116
Carouge . . .	2,042	2,425	118
The rest of the Canton . . .	10,717	11,095	103½
	29,752	32,119	108

The aggregate population of the city and its three suburbs, *Les Pâquis*, *Les Eaux-Vives*, and *Plainpalais*, is thus 36,392 souls.

The number of families, or *foix*, is 14,803 for the whole canton.

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This letter has already reached to such a length that I must content myself with a mere mention of the second volume of the 'Documents Statistiques recueillis par la Commission de Statistique des Etats Sardes,' published in 4to. at Turin, giving an account of the progress of population; and 'Geological Considerations on Mount Salève (near Geneva), and on the Environs of Geneva,' a memoir written by our fellow-citizen M. Alphonse Favre.

III.—*On the Desiccation of the Tanghi-Daria, a branch of the Jaxartes.* Addressed to Mr. Murchison, President of the Royal Geographical Society, by M. N. de KHANIKOFF. Translated by the Editor.

St. Petersbourg, 19th October, 1844.

SIR,

KNOWING the interest you take in everything connected with the geography of Central Asia, I conceive it my duty to acquaint you with a geographical misconception which appears to me to be not unworthy the attention of the learned.

You are aware, sir, that the Baron Meyendorff and Professor Eversmann, the travelling companions of Mr. Nigri, our *Chargé d'Affaires* at Bokhara, who first brought to Europe the account of the sudden drying up of one of the arms of the Jaxartes, known under the name of Tanghi-Daria, surprised to find a completely desiccated bed where they expected, from all former statements, to have found a considerable stream, and led into error by the feigned ignorance of their Khirgiz guide of the cause of this phenomenon, too hastily attributed it to the dryness of the atmosphere (*i.e.*, to evaporation). But although this fact, which has some analogy with the desiccation of the ancient bed of the Oxus, produced at the time some sensation among geographers, no one, as far as I know, has expressed any doubts as to the explanation given of it by Messrs. Meyendorff and Eversmann; and, like a thing determined and acknowledged, both the fact and the explanation have been reproduced in several subsequent publications, and among others in the description of the Steppes of the Khirgiz of M. Levschin, and in the Memoir on the Ancient Course of the Oxus, published by M. Jaubert in the '*Nouveau Journal Asiatique*' for December, 1833, which is so much the more extraordinary as this hypothesis is opposed to the truth and cannot bear examination.

Whoever will take the trouble to consider the subject will easily be convinced that the dryness of the atmosphere can have contributed to the desiccation of the Tanghi-Daria only by diminishing the volume of water of the Sir, and thus sinking its surface below the bottom of the bed of the Tanghi-Daria at its source. Now a rapid glance at the excellent map which accompanies M. Meyendorff's work will suffice to convince any one that the source of the Tanghi-Daria is absolutely the same with that of the Kouvan; hence it is impossible to understand how the atmospheric dryness, having desiccated the Tanghi-Daria, should have produced no change in the Kouvan, which to the present day has not been observed to have undergone any alteration.

Such were my doubts till the year 1841, when I had an opportunity of visiting the dried-up bed of the Tanghi-Daria; and when I discovered that it was an enormous channel with precipitous banks, and having a breadth of from 140 to 210 feet, with a depth of from 14 to 21, I became convinced of the impossibility of atmospheric action alone having dried up the river; and by questioning the Khirgiz, who have long inhabited this part of the Steppe, I have been enabled to clear up the enigma, whose solution was not wholly unknown to M. de Meyendorff, but which he rejected as appearing to him improbable, though, as you will see, it is very simple.

About the year 1815 the Khokanians learnt that the inhabitants of the Khanat of Khiva intended to plant colonies on the banks of the Tanghi-Daria; and fearing the disagreeable consequences of the proximity of such unpleasant neighbours, they erected a strong dyke at the point where this branch diverges from the Sir, by which the Tanghi-Daria, deprived of the supply from that river, naturally emptied its waters into the Lake Aral, and its bed, deprived of any tribute, very soon became completely dry, so that there is nothing astonishing in the fact of our travellers of 1820 having found a thick forest of saxaúl (*Anabasis ammodendron*) in place of a stream of water. At Bokhara the assertion of the Khirgiz was fully confirmed to me by the late unfortunate Capt. Conolly, who, in travelling from Khiva to Khokand, saw with his own eyes the great dyke above mentioned, and examined it in all its details. Finally, sir, I have lately had the pleasure of finding in our archives the name of the last European traveller who saw the Tanghi-Daria still a well-supplied stream: he was the interpreter to the Boundary Commission of Orenbourg—Lieut. Abul Nasir Soubankouloff, who was sent to Bokhara in 1809. In his Journal we read:—

“11th December, 1809 (O.S.).—After having passed a sandy steppe, which appears to be 15 verstes in width, we arrived at the ruins of a brick-built edifice called Sarli-tam. It is situated on the banks of the Tanghi-Daria, which is here 30 sagines (210 English feet) wide, and which we crossed on the ice, but which in summer is forded at this place. On the two banks of this river there grows a great quantity of saxaúl and of kamysch.”

On the 3rd of May, 1810, he again visited the Tanghi-Daria, of which he speaks thus:—“At this spot” (he does not specify it) “the river is 30 sagines wide and 2 archines (4 feet 8 inches) deep. Having taken in here our provision of water, we passed the night in the Kizil-Kúm, in sight of the ruins Tchirik Kobat.”

Returning from thence to Bokhara, he started definitively for Orenbourg on the 17th of July (O.S.), and again passing the

Tanghi-Daria on the 8th of August near the ruins of Sarli-tam, remained five days on the borders of the stream to recruit his camels after their fatiguing journey across the Kizil-Kúm.

Such, sir, is the very natural explanation of a sufficiently remarkable geographical fact, and which I think it right to make known, in order to spare future geographers the trouble of framing more or less ingenious hypotheses to account for it. And as this fact bears some analogy, as I have before observed, to the change in the course of the Oxus, perhaps it may induce the learned, with regard to this question also, to come back, after many surmises, to the simple explanation afforded by the worthy Mr. Jenkinson, who said, "The water that serveth all that countrey is drawn by ditches out of the river Oxus, unto the great destruction of that river, *for which cause* it falleth not into the Caspian Sea, as it has done in times past, and in short time all that land is like to be destroyed and to become a wilderness for want of water when the river Oxus shal faile."*

* The passage will be found in Hakluyt, vol. i., p. 367, ed. of 1809. A little before, however, Mr. Jenkinson gives a different reason for the Oxus no longer reaching the Caspian. The fact is, there is much confusion on this subject, which is one well worthy of being thoroughly examined.—ED.

NOTE.

M. D'Arvezac has obligingly called our attention to a few inadvertences in the President's Address, which we therefore hasten to correct; we also add some further information supplied by our zealous correspondent.

Page lxxxiii, lines 19, 24, and 29, *for* Col. Denaix, *read* Col. Lapié.

„ lxxxiv, line 24, *for* is about to undertake, *read* has undertaken.

„ lxxxv, „ 25, *for* M. Jomard we learn is, *read* The Viscount Santarem and M. Jomard, we learn, are.

„ ib., „ 32, *for* M. Fontaine, *read* M. Fontanier.

„ cx, „ 5. Messrs. Combes and Tamisier. A new map of the routes of these travellers in Abyssinia has been constructed from their notes, much more satisfactory than the one they had themselves prepared.

„ cx, „ 26. The brothers d'Abaddie. According to the latest news (date not mentioned), the elder d'Abaddie was in Gajam, and Arnaud d'Abaddie on the other side of the Abai, to the eastward, separated from each other by civil wars.

„ cxii, „ 8. M. Dillon. This gentleman died before the return of M. Lefebvre to Abyssinia.

„ ib., „ 15. M. Vignaud was attached to the expedition of M. Lefebvre.

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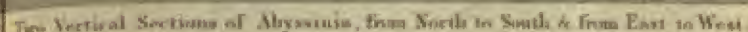
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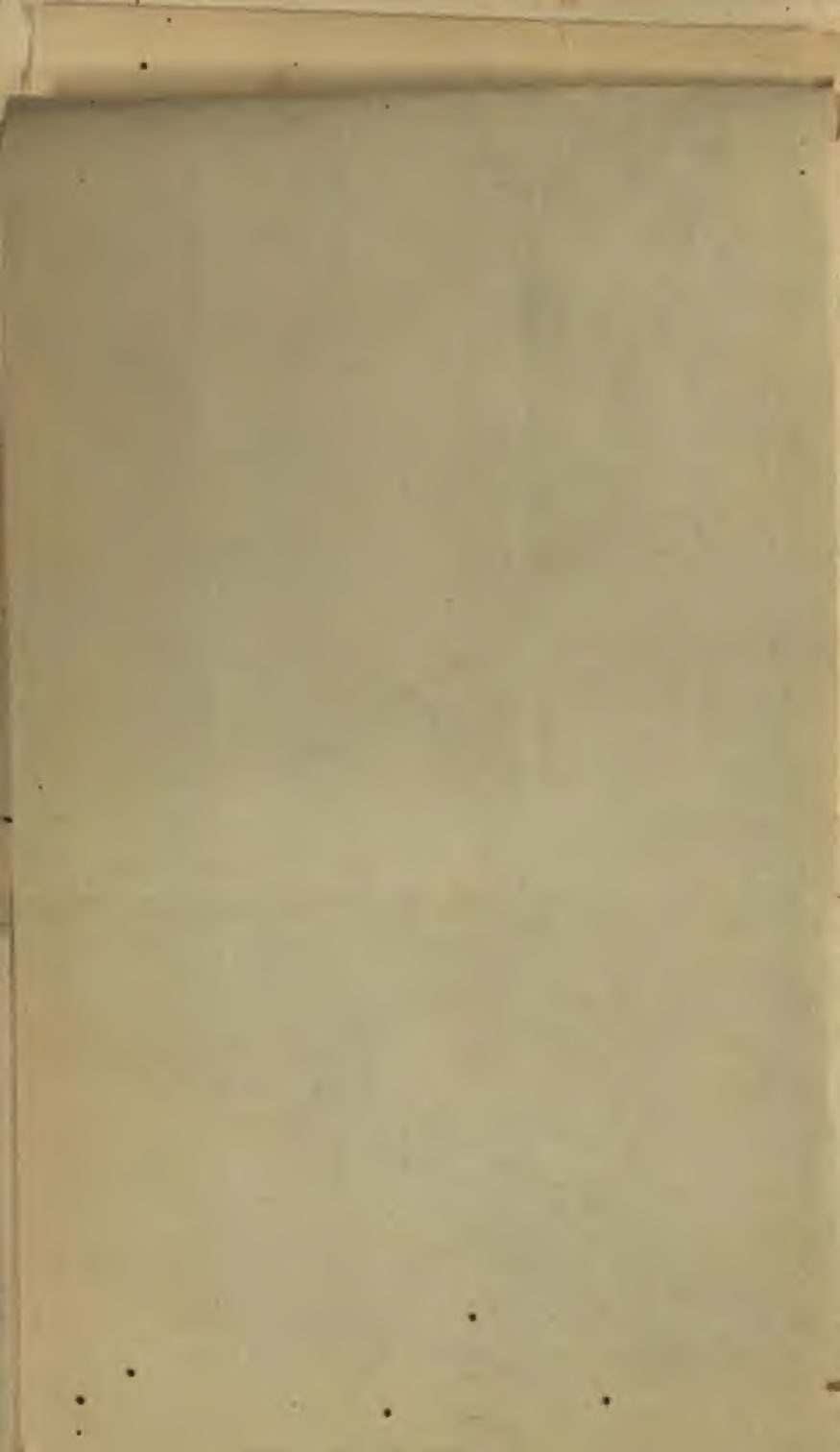
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(H) Politics versus environmental health



Section of the Course of the River Abai from its Source to its Junction with the Bahr el Abiad or Sile at Khartoum





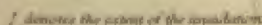


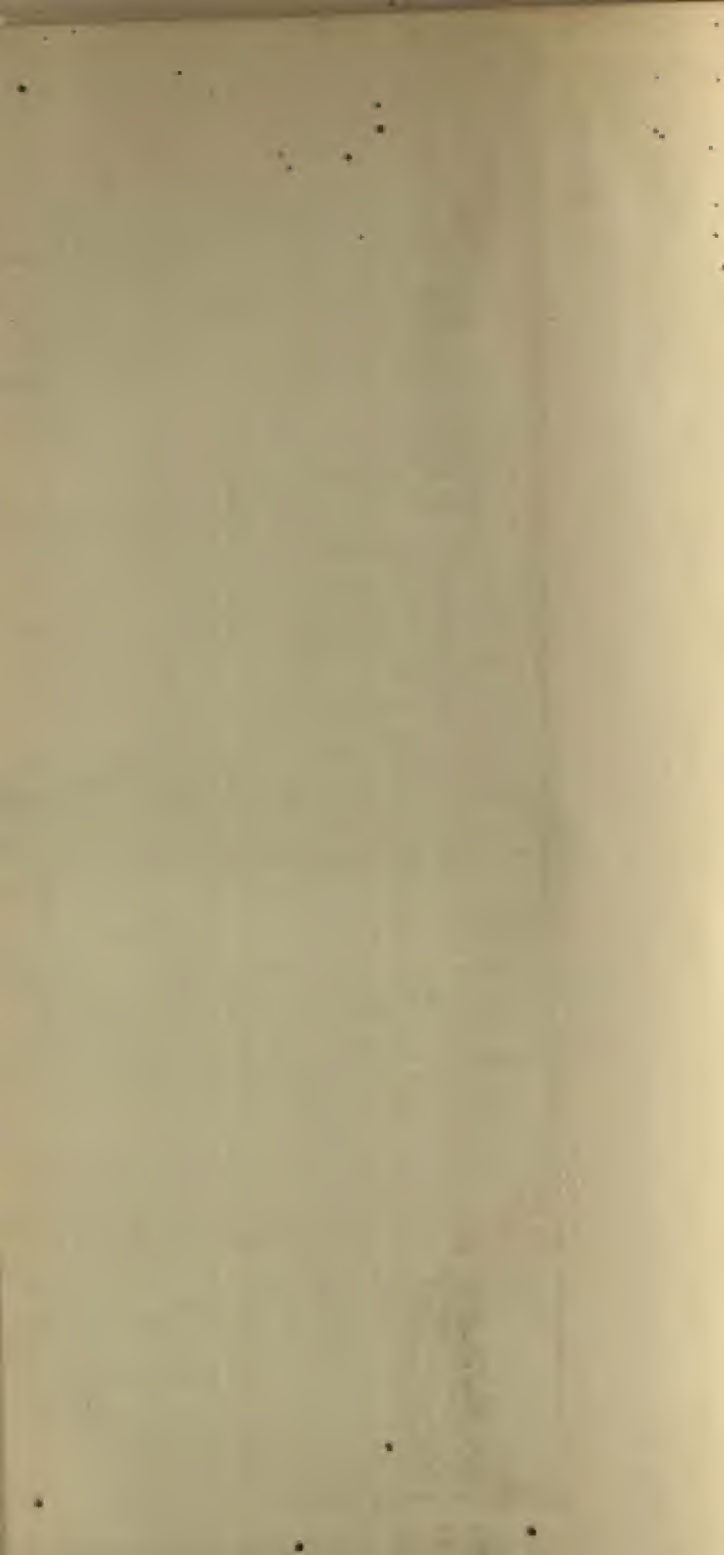




to illustrate a paper
communicated by

1841.





Rough Sketch
of the
RIVER KARUN
to illustrate
Lieut Selby's Paper
1842.

0 10 20 30
English Miles







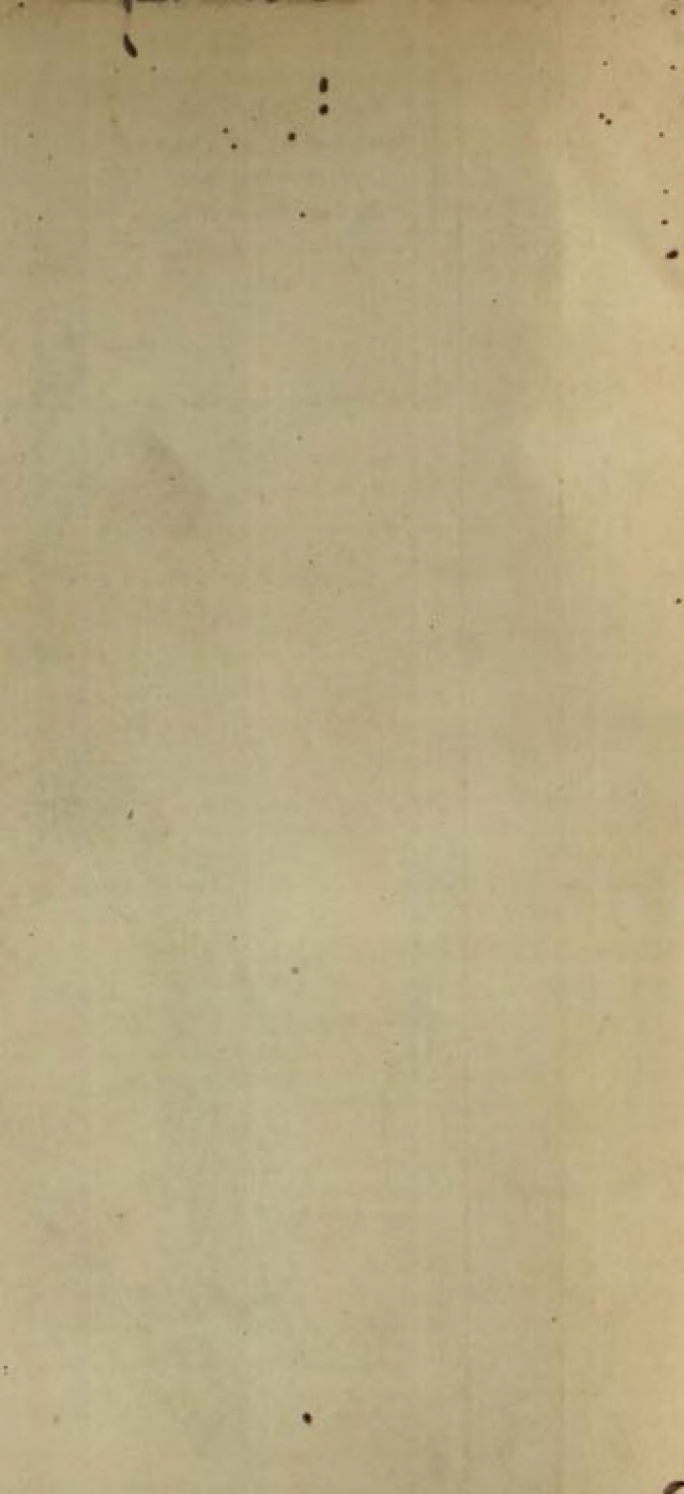


By Captⁿ Frome R^l Eng^s
Surv^r Gen^l of the Colony

Fig. 1. *Fraxinus* *Rehderi* on G. *glaberrima* stand.

First, surely, doesn't it have to do with the location of the new building by recreational use making the community more with standard activity. Is that a cultural pattern of opportunity directed toward

Land & water from the
top of the mountain
at the 1st of the 1st of the 1st
the first day



N.C.

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"A book that is shut is but a block"

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